Class DC 26

Book .B93

Fig. 1. pag. 38.

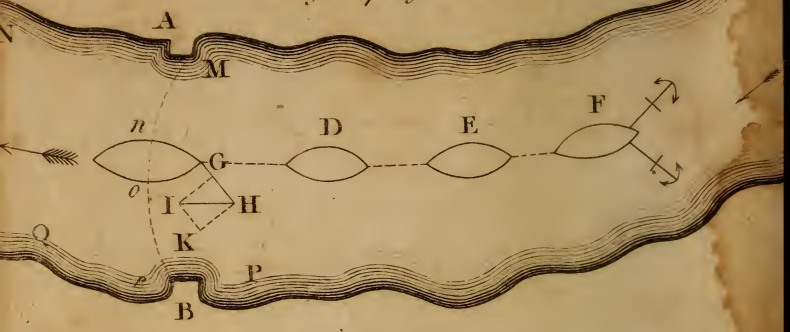


Fig. 2. pag. 224.

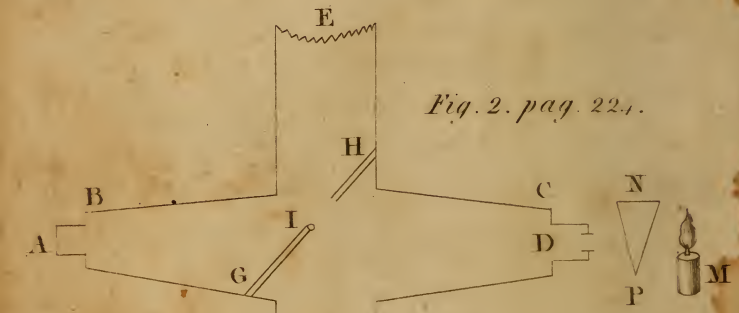
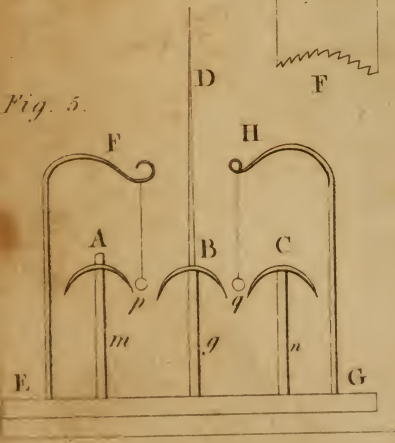
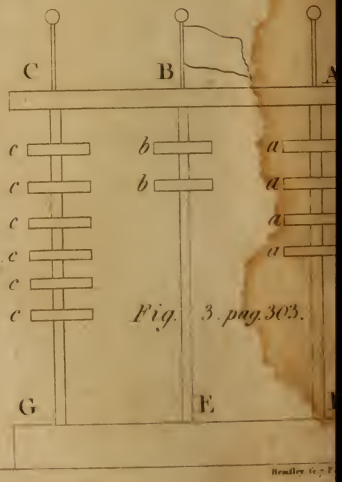


Fig. 5.





Printed for R. Phillips, N° 71, St. Paul's Church Yard.

TRAVELS

IN THE

FRENCH REPUBLIC:

CONTAINING

A CIRCUMSTANTIAL VIEW

OF THE

PRESENT STATE OF LEARNING,

THE

ARTS, MANUFACTURES, LEARNED SOCIETIES,

MANNERS, &c.

IN THAT COUNTRY.

BY THOMAS BYGGÉ,

PROFESSOR OF MATHEMATICAL ASTRONOMY IN THE UNIVERSITY OF COPENHAGEN, LATE COMMISSIONER FROM DENMARK TO THE NATIONAL INSTITUTE, AND MEMBER OF SEVERAL LEARNED SOCIETIES AND ACADEMIES OF SCIENCES.

TRANSLATED FROM THE DANISH

BY

JOHN JONES, L L.D.

LIBRARY OF CONGRESS CITY OF WASHINGTON

London:

Printed by T. Gillet, Salisbury-Square,

FOR R. PHILLIPS, NO. 71, ST. PAUL'S-CHURCH-YARD; SOLD BY T. HURST, PATERNOSTER-ROW; BY CARPENTER AND CO. OLD BOND-STREET; AND BY ALL BOOKSELLERS.

1801.

[*Price Six Shillings in Boards.*]

TRANSLATOR'S PREFACE.

DC 26
.B93

THE

TRANSLATOR'S PREFACE.

THE internal ſtate of France is ſo little known in this country, that any work which offers candid information on that ſubject, cannot fail to be acceptable to the public. In this view, it is preſumed, that a tranſlation of PROFESSOR BYGGE'S late performance will meet with that favourable reception, which the tranſlator will venture to ſay it deſerves, from the generality of Engliſh readers. The ſituation of the author as a public commiſſioner

from a neutral ſtate, afforded him ample opportunities of information, and his ability to improve thoſe opportunities will, it is believed, be apparent to every ordinary reader of the following pages; while the fidelity, or at leaſt the conſiſtency of his deſcriptions, and the candour of his remarks, will be abundantly evident to the more attentive and intelligent. His reflections appear to be dictated by penetration, impartiality, and rational diſcrimination. He approves, cenſures, or ſuſpends his judgment, like an honeſt, enlightened, and cautious man, who is a ſtranger to oſtentation, and accuſtomed to profound views of ſcience and of human nature; and his work, though written in a popular ſtyle, and for general peruſal, exhibits evident traces of the hand of a maſter.

The

The manner in which the tranſlation has been executed, muſt be left to the deciſion of thoſe who are acquainted with the ſubjects of the work, and with the language in which it was written. The tranſlator can only ſay, that he has done his utmoſt to convey the ſenſe of the original in a pure Engliſh idiom.

As his diſtance from town rendered the Correction of the work extremely inconvenient to him, that taſk has been performed, with obvious ability, by Dr. WILLIAM DICKSON*, to whom the work is alſo indebted for the notes, marked *Tranſlator*,

* Author of Letters on Slavery, and other performances, and well known for his early and perſevering exertions in favour of the abolition of the Slave Trade.

which, it is believed, will be found valuable additions to the text.

The curiosity which most persons feel to know something of the lives and characters of the authors whose works they peruse, has induced him to lay before the reader of the present volume the following accurate memoirs.

Thomas Byggé, professor of mathematics and astronomy in the university of Copenhagen, and for the Royal Navy, and member of several learned societies and academies of sciences, is, since the death of Tycho Brahe, and the restoration of astronomy in Denmark, the *eighth* astronomer in succession, of the royal observatory at Copenhagen. After the destruction of Tycho's observatory, on the island

of

of Huen, Chriſtian IV. in the year 1632, erected in his capital a new and ſtately *Uranienburg*. It is a tower one hundred and twenty Rhineland feet in height,* conſtructed with great ſtrength and ſolidity, and with much architectural ſkill. From the ſummit of the building there is a very fine proſpect. The winding ſtaircaſe which leads to it, forms with the horizon an angle of only $5\frac{1}{2}$ degrees, and makes an aſcent ſo commodious and eaſy, that, in the year 1716, the Czar *Peter* the Great ſeveral times rode up it, and his conſort, the Empreſs Catharine, drove up and down in a coach and ſix.

Chriſtian Severin Longomontanus, the pupil of Tycho Brahe, was the firſt aſtronomer appointed to ſuperintend this new

* Nearly 124 feet Engliſh.

royal obſervatory: he died in 1647, and was ſucceeded in his office by *George Fromm*, who did not long enjoy it; as in 1651 he made room for *William Lange*. After his deceaſe, the celebrated Olaus Römer, whoſe merit foreign nations, and eſpecially the French, well knew how to appreciate, was recalled from Paris. He held the poſt of aſtronomer for thirty years: but unfortunately a great part of his valuable obſervations and manuſcripts were loſt in the great fire, in the year 1728, which laid in aſhes the obſervatory, and almoſt the whole city of Copenhagen.

Römer died on the 19th of September, 1710, and his place was ſupplied for a ſhort time by Lawrence Shive, one of his aſtronomical aſſiſtants, who did not ſurvive him longer than the year 1714.—To him ſucceeded

ceeded *Peter Horrebow*, a pupil of Römer's: through his endeavours, the obſervatory, which had been burnt down, was rebuilt, and new inſtruments procured. When far advanced in years, he reſigned his place in 1753, to his ſon *Chriſtian Horrebow*, who in 1777, was ſucceeded by *Thomas Byggé*, the ſubject of the preſent memoirs.

Through the zeal and activity of Profeſſor Byggé, the obſervatory again underwent a thorough repair in 1780, and was enriched with new inſtruments, ſuch as the preſent ſtate of the ſciences required. A circumſtantial account of theſe may be ſeen in a work publiſhed at Copenhagen, entitled "*Obſervationes Aſtronomicæ, annis* 1781, 1782, 1783, *inſtitutæ, in Obſervatorio Regio Haunienſi*," *&c.*

Thomas Byggé holds a diſtinguiſhed rank, not only among the moſt uſeful aſtronomers of Europe, but likewiſe among the moſt active promoters of the ſcience of geography. He took an active eſſential part in compiling the excellent and beautiful maps, publiſhed by the royal academy of ſciences at Copenhagen.—When the deſign of preparing theſe maps was formed, Profeſſor Byggé was appointed the firſt trigonometrical and aſtronomical obſerver. But theſe are not the only ſervices he has rendered to geography, in a more extenſive degree has he contributed to the advancement of that ſcience, by forming under his care a number of young men. Soeberg, the brothers Wibe, D'Aubert, Rich, Pihl, Fievog, Ginge, Engelhart, &c. names eminent in the annals of aſtronomy, emerged from the ſchool of

Byggé.

Byggé. A number of young officers in the Daniſh navy and army enjoyed Byggé's inſtructions in practical aſtronomy, and under him acquired that knowledge which enabled them to furniſh many uſeful and valuable obſervations from Norway, Iceland, Greenland, and the Eaſt and Weſt Indies and thereby improved the defective geography of thoſe regions.

None of Byggé's predeceſſors, ſo immediately and directly as he, applied aſtronomy to the benefit of his country, and to the advancement of navigation. By his very accurate menſurations, a fairer baſis of contribution, new calculations, and juſter fiſcal regulations were eſtabliſhed, which, being more accurately proportioned to the poſſeſſions of the different contributors, many errors and defects in political œco-

nomy, and innumerable litigations concerning landed property were thereby prevented. He alſo determined and laid down with the greateſt care, the true poſition of all the coaſts, harbours, iſlands, rocks, and ſand-banks in the Belts, and the Categate, which are very dangerous to ſhips, and were before partly unknown; and thus he rendered the navigation of the Daniſh ſeas more ſecure.

YARMOUTH,
January 1801.

JOHN JONES.

CONTENTS.

LETTER I.

JOURNEY from Copenhagen to Altona.—The Author's Object to confer with the French Commissaries at Paris, on the Uniformity of Weights and Measures—Excellent Roads and Bridges—Colony of Moravians—Excellent Regulations—Altona thrives by the War—Villas, Pleasure Grounds, &c.—Pointed and blunt electric Conductors compared—Curious Tide-Machine—Surprising Chemical Discovery—Agricultural Improvements—Philosophical Apparatus

Page 1

LETTER II.

Journey from Altona, through Osnaburg and Munster, to Wesel.—Sluices—Roads—Cottages of the Boors—Soil—Disagreeable Travelling in the Hanoverian Territory—Interrogations of the Prussian Guard—Plantations of Wood in Hanover—Prussian Soldier very severely punished for begging—Peasants uncomfortably situated

situated—Osnaburg a dirty Place—Hanover little improved for the last Twenty-two Years—Denmark very much, owing to the excellent Measures of its Government—The Bonds of Servitude relaxed—Yet agricultural Improvements not complete—Recapitulation of them—Manufacture of Linen and Tobacco—Coal-Pits worked by the Crown—Fine Valley from Lengerick to Munster—Munster a neat Town—Superstition of the Inhabitants—Feudal System still oppresses Osnaburg and Munster—Boors miserable Slaves—Feeble Manufactures at Dorstein—Conversation with Emigrants of Rank - - Page 16

LETTER III.

Journey from Wesel across the Rhine, and through Part of Belgium to Brussels.—Wesel, a neat Town—Pass demanded—Fly Boat on the Rhine described—French Officers reported to be rude, but found civil—Gueldern, a small genteel Town, oppressed by the French—Priests forbidden to keep the useful register of Births, &c.—Fine Plantations of wood, and other Improvements—Curious Sluice uniting the Maes with two other Rivers—Cloisters at Maasyk sold or converted into Barracks—Crucifix

Crucifixes, &c. carried off—Fine Chimes, especially at Tirlemont—Country ſtill exhibits remains of Proſperity, and why—Louvain Univerſity, &c. diſſolved—Bitter Complaints there of French Impoſts, which are not attended to—Cauſeways, or paved Roads, deſcribed.

Page 36

LETTER IV.

Stay in Bruſſels, and Journey thence to Paris:—Bruſſels deſcribed—The Conſeil Souverain plundered—The Viceroy's Palace converted into a Central School—Its Claſſes—Public Library—Churches deſpoiled—Manufactures—Travelling Carriages drawn by Dogs—Belgians diſlike the New Government, and why—At Mons an Altar expoſed to Sale—Coal Pits—Jemappe—Good Cultivation—Roads neglected—Valenciennes not repaired ſince the Siege—Hoſt of Beggars there, and why—A Shoemaker the Chief of the Municipality at Valenciennes—French Villages mean and poor—Boys and Girls reaping the Harveſt, and why—Three and four wheeled Carts compared—Horſes cruelly treated in France—Roads neglected, though Tolls high—Bouchain a ſtrong but mean Place—Cambray neat and clean—French Poſts properly

properly regulated—Chantilly plundered—Approach to Paris charming - 51

LETTER V.

Course of Instruction in the Primary, Central, and Polytechnic Schools.—Primary Schools well conducted in Paris, but not in the Country—The Revolution subverted the best old Institutions—Normal Schools—Fault in conducting them—Sciences taught in them—Journal of the Lectures and Debates in them—Dissolution of them—Regulations of the Central Schools—School of the Four Nations—Scientific Courses in it—Second and third Central Schools—List of Departments with and without Central Schools—Defects in those already established—The French shew no Wish to learn foreign Languages—Morality and Geography not taught in the Central Schools—Ancient Literature little attended to in them—The Pupils in them but superficially instructed—Some of the Teachers ill qualified—Polytechnic School—Course of Study in it—Philosophical Apparatus, Library, and Collection of Models belonging to it—Public Examination of the Students Page 70

LETTER VI.

Schools for Public Services, viz. for the Conſtruction of Roads and Bridges, for Mineralogy, Geography, Ship Building, Artillery, Fortification, Navigation, &c.—School Houſe formerly a Palace—Collection of Models—Library—Courſe of Study and Salary of the Students—Mineralogical School and Collection—Profeſſors—Laboratory—Learned Ladies, not always pretty and neat—Gravimeter, not equal to a good Hydroſtatic Balance—Inſtrument for meaſuring the Angles of Cryſtals—Inſtrument for aſcertaining ſmall Degrees of Magnetiſm and Electricity—Geographical School—School for Naval Architecture—Marine Depoſitory—Artillery Schools—Fortification School—Marine School. - - Page 112

LETTER VII.

Schools for Medicine, Pharmacy, and the Fine Arts—The French College—Medical School—Collections of anatomical Preparations, &c.—Philoſophical Apparatus—Library—Amphitheatre—Lectures—Students from one Thouſand to one Thouſand two Hundred—Free School for

for Pharmacy—Military Hospital—Lectures there—Free School for Painting—National School for Architecture—French College—Lectures there—Public Assembly of it, and Proceedings on the Occasion—Hint to Ladies to make themselves useful, by visiting and attending the Sick - - Page 132

LETTER VIII.

The National Museum of Natural History.—Library, Menagerie, &c. of this Museum—Its Botanic Garden—English said to have seized Baudouin's Collection, which their Government had promised to protect—Gallery for Natural History—Vaillant's frugal Present to the Museum—Diamond stolen from it—Collection of Quadrupedes, Zebra, Elephant, &c.—Directorial Palace—Collection of Skeletons—Library of Botany, &c.—Paintings and Drawings of Animals and Plants—Menagerie for wild and tame Animals—Lecture Room, a real Amphitheatre—Lecturers and Officers—Statues of Linnæus and Buffon—Wanton Outrages of the Mob at the Revolution—Dead dug up—Body of Turenne, still undecayed; shamefully exposed—Chests still unpacked, filled with Curiosities from the conquered Countries. 147

LETTER IX.

The Central Museum for Arts at Paris, and the Museum for the French School at Versailles.—The Central Museum, a general Collection of Statues, Paintings, &c.—Entrance—Gallery of Apollo—Picture Gallery five hundred Feet long—Pictures and Statues from Italy, greatly injured on the Journey—Catalogues of Paintings brought from Italy, &c. which greatly exceeded the Author's Expectations—Saloon of Lacoön to be prepared—Exhibition of the Works of French Painters, Statuaries, Draughtsmen, and Engravers now living—General Museum for French Painting. Page 161

LETTER X.

Of the National Observatory at Paris—The Danes first erected an Observatory—The Parisian Observatory, as a Building—Was decaying before the Revolution—Injured during the Reign of Terrorism—M. Jeaurat, an old and able Astronomer, now thrust down into a Cellar, and ill provided for—The Observatory under Repair—Astronomical Instruments, by Dollond, &c.—The French have but lately

used

uſed tranſit Inſtruments—Large Teleſcope, a mean Inſtrument, and almoſt uſeleſs.—Teleſcope with Specula of Platina—An Achromatic, by Rochette, far inferior to one of the ſame Dimenſions, by Nairne and Blunt—The Paris Obſervatory inferior to thoſe of Greenwich, Edinburgh, Copenhagen, &c. - Page 231

LETTER XI.

Account of the National Obſervatory continued.—A Time Piece, by Berthoud, goes well, as do twelve or fourteen by Arnould—Platina well purified, makes excellent Specula—Story of a Reflector of ſixty Feet, with Platina Specula, a mere Rhodomontade—Inſtruments of De la Hire, &c. diſuſed, but preſerved—Obſervations interrupted by the Revolution—Caſſini's large Lunar Chart and Drawings of Lunar Maculæ, recovered after being long loſt—His reduced Lunar Chart—The beſt is in Keill's Lectures, as improved by Lemonnier—Improvements in the Obſervatory—Le Noir's Tranſit Inſtrument deſcribed—Mural Quadrants by Bird and Siſſon—Aſtronomical Sector, by Graham. - 198

LETTER XII.

National Observatory continued—Observatories of the Military School, or the French College, and of Private Persons—Instruments for ascertaining the magnetical Variation—Caves of the Observatory described—Magnetical Variation and Temperature in them—Searched for Arms and Aristocrats—Observatory advertised for Sale—Cassini driven from it, and now in poor Circumstances—Platina Specula, by Carrochè—His excellent Achromatic—Pillars for the transit Instrument too low—Wall of the Mural Quadrant spoiled by the capricious Builder—Mechain's Astronomical Labours—Bouvard's Comparison of Arabian Observations with later ones—Defective Organization of the National Observatory—Telegraphs in Paris—Observatories at the Military School, and the French College—Lalande's Merits not sufficiently acknowledged—Observatories of Messier and Delambre. 231

LETTER XIII.

The Board of Longitude, the Board of Geography, the National Library, and the Libraries of the Arsenal and the Pantheon.—The Bureau des Longitudes

gitudes, instituted in Imitation of the British Board of Longitude, but with ampler Powers—Of whom composed—Fleurieu's large Marine Atlas—Business of the Board of Geography—Excellent mathematical Tables—The War deprives France of Men and Money—Large Maps of France and Denmark—Cassini suspected, and his Maps, &c. locked up—National Library and its Regulations—Pair of Globes thirty Feet in Diameter, an useless astronomical Luxury—MS. Letters of Colbert, &c.—Prints—Antiques—Egyptian Curiosities—Shields of Scipio and Hannibal—Intaglios—Antiquities despised in France—Schools for oriental Languages—Libraries of the Arsenal and Pantheon—Libraries, Paintings, &c. of those banished, &c. partly destroyed, partly formed into new Collections. Page 258

LETTER XIV.

The National Institute, with an Account of its Meetings.—Academy of Sciences, &c. founded by Louis XIV. and Colbert—Respectable at the Revolution—National Institute, founded on their Ruins, more comprehensive—Its Members, Classes, Sections, and Times of Meeting—Proposes Prize Questions—Its Members and Pupils to travel for

for Information, at the Public Expence—Is the first learned Body in Europe—National Palace of the Arts and Sciences described—Fire Escapes, which did not answer the End—Meetings of the Institute, and Memoirs read—Ministerial Impertinence and Partiality, in the Case of Bralle—Numerical Telegraph proposed—Maskelyn's Name partially omitted in a Report concerning the Longitude—Excellent Pun—Mercury frozen—Severe Frosts at Paris—Reviews of the Institute, impartial and well written—Ministers often ask the Opinion of the Institute—Its solemn Meetings—Artists rewarded and crowned.—Arts and Manufactures—New Animal—Bougainville's Eulogy of Cook, &c.—Memoirs, Publications, and Pursuits of the Members of the National Institute—The Author falsely accused of calumniating that learned Body 285

LETTER XV.

The Aerostatic School in Meudon—French Monuments—Establishment, Officers, Pupils—Design of this Institution—Conté, his Invention—Aerostatic Soldiers—Materials of which those Air Balloons are composed—Mode of filling them—French Monuments—Such as escaped the Fury of the Populace, ordered to be collected and depo-

and

ſited in the ſmall Auguſtine Monaſtery---Saloons ſet apart for that Purpoſe---Claſſification, Taſte, and Induſtry of Le Noir—Monuments of Kings, Queens, Stateſmen, Warriors, Men of Letters, &c.---Statues in Marble, Bronze, &c.---Names of the Artiſts who deſigned and executed them---Some of them the boldeſt and happieſt Efforts of Genius---Inſcriptions---Annealed Glaſs--Painting on Glaſs—Churches, &c. whence they were taken—Several mutilated Pieces of Art reſtored —Reflections on the Whole 350

LETTER XVI.

Preſent State of the Manufactures of France—Exhibition of various French Manufactures, Arts, &c.—Watchwork—Artificial Black Lead Pencils—Files—Economic Stoves—Locks—Chemical Productions—Woven and Printed Tapeſtry—Earthenware—Steel-work—Silk, Cotton, Linen, Leather, Sealing-wax, Chryſtal Glaſs—Weights and Meaſures—Stereotypic Printing—Porcelain —Spinning Machines—Mechanical Engravings &c. 382

TRAVELS TO PARIS.

LETTER I.

JOURNEY FROM COPENHAGEN TO ALTONA.

The Author's Object to confer with the French Commiſſaries at Paris, on the Uniformity of Weights and Meaſures—Excellent Roads and Bridges—Colony of Moravians—Excellent Regulations—Altona thrives by the War—Villas, Pleaſure-Grounds, &c.—Pointed and blunt electric Conductors compared—Curious Tide-Machine—Surpriſing chemical Diſcovery—Agricultural Improvements—Philoſophical Apparatus.

I Take up my pen to fulfil my promiſe, that I would occaſionally communicate ſuch particulars as arreſted my attention in the courſe of my travels. You know the object was, in purſuance of the invitation

held out by the French government to the allied and neutral powers, to confer with the commiſſaries of the Pariſian National Inſtitute, and the foreign commiſſaries aſſembled, with a view to eſtabliſh a ſtandard for the uniformity of weights and meaſures. I do not recollect that I ſhewed my paſs, which I received from the French legation on the occaſion, through *Deſaugers* the *Chargé d'affaires*, in the abſence of the miniſter Grouvelle. It was drawn up in the new French manner, and differed in two things from the uſual Daniſh paſſes; for my whole perſon was minutely deſcribed, and I was obliged to ſubſcribe it. Theſe precautions were neceſſary, in order to prevent the transfer of it, which is frequently the caſe with the uſual paſſes. The objects of my journey were alſo ſet forth in a manner honourable to myſelf, the benefit of which I experienced in France, where I was not conſidered as an ordinary traveller, but as one inveſted with a reſpectable miſſion.

The

The French Embaſſy ſent ſeveral notes to Count Bernſtorff, the Secretary of State, to haſten my departure; as it was ſuppoſed that the courſe of experiments had already commenced: I ſoon found, however, that this was not the caſe.

On the 21ſt of July, 1798, I received the royal mandate relative to my journey, and on the 29th, I ſet out from Copenhagen: I took my way through Fühnen to Middelfart. A great part of the new road is already completed, and the cauſeway is excellent. Such is the ſkill and experience of the engineers and overſeers, the abundance of good materials which offer themſelves on all hands in Fühnen and the natural diſpoſition of the ſoil, that the roads may be rendered very durable, and eaſily repaired. Where the *ſubſtratum* is gravel or ſand, or ſand lightly mixed with clay or mould, the road is in general good, but when the foundation is pure and ſtrong clay, the froſt or bad weather injure it, and when it thaws, the pavements ſuffer very much. We have

an inſtance of this on the road between Copenhagen and Roeſkilde Inn which is the worſt part; but the road from Copenhagen to Rorsöer is very good: yet it might be made better by being raiſed a little higher, and ſomewhat rounded. The bridges in Fühnen over the Bekke and the Aaer, (of which ſome are worthy of notice) are excellently deſigned and well built. Our new roads in Denmark are ſandy, and cauſeways properly ſo called, that is, the foundation is compoſed of ſquare ſtones, each in the form of a cheſt, from one to two feet thick, placed at a proper diſtance; the interſtices are filled up with ſtones, gradually diminiſhing in ſize as they advance; upwards; ſo that the uppermoſt does not exceed two inches in thickneſs. When all theſe have ſunk with their own weight, they are covered with gravel, to the depth of from ſix to eight inches. Theſe roads are as even as a parlour floor, and may be paſſed with the greateſt caſe and convenience. Moſt of the roads which I have travelled through

through Germany, Belgium and France, cannot be properly called cauſeways. In moſt places, however, bridges are very judiciouſly erected, the want of which was formerly very much felt. The burgomaſter Dickman Kolding, in my opinion, deſerves the preference in works of this kind. I ſhould not have dwelt ſo long on this ſubject, were it not that our roads in Denmark are generally good, and under proper regulations: Snoghoy is the only exception in the whole route to Hamburgh. At the former place, the traveller is obliged to take boat to croſs the little belt to Kolding.

I flattered myſelf that I ſhould have an opportunity of ſeeing the colony of the Herrenhuters, or Moravians, in Chriſtiansfeldt, which is become conſiderable, through their induſtry and manufactures, and above all, by their morality and prudent conduct; but I travelled through it by night, ſo that I was deprived of that pleaſure.

I did not proceed entirely by the common poſt through Apenrade, Flenſborg,

Sleſwick, Renſborg, Remmels, Itzeboe, Elmſhorn, and Pinneberg. There are many good regulations in Holſtein; and the traveller is called on at every poſt-houſe, to tell in what manner he was treated by the poſt-boy. I arrived in Altona in the afternoon of the 3d of Auguſt. I had a letter of introduction to Mr. Lawæts, one of the Senators, who, with his worthy lady, received me with the utmoſt politeneſs. I formed an acquaintance in his houſe with many of the profeſſors of the Gymnaſium.

Altona has profited very much by the preſent war, particularly during the laſt year, inſomuch that the buildings are rapidly extending to the village of Ottenſee, which, in reſpect to police, is ſubject to the magiſtrate of Altona, the reſt being under the magiſtracy of Penneberg. The harbour has been rendered ſo capacious, that it can now contain double the number of veſſels which it formerly did; the expence of the improvements having been defrayed by the

town

town itſelf. It is well ſituated for trade, and I hope will at all times be crowded with ſhipping, and one day cope with its rich neighbour and powerful rival. The free exerciſe of public worſhip is permitted in Altona: the Lutherans, Catholics, Mennoniſts, Jews, &c. build churches wherever they pleaſe, and ſome of them are neat enough. Luxury, however, has pervaded almoſt every rank in Hamburgh, and Altona begins to be infected with the example. The Altoniſh ladies, generally ſpeaking, dreſs with great elegance and taſte, and at the ſame time with ſuch prudence and œconomy, as not to be very chargeable to their parents.

It is not ſurprizing that the rich Hamburgh merchant, whoſe mind is wholly occupied ſix days in the week with mercantile ſpeculations, ſhould be glad on the ſeventh to eſcape from his counting-houſe to breathe the free air, and enjoy the beauties of nature. The charming ſituation of the Daniſh bank of the Elbe, has in-

duced many of thoſe opulent perſons to prefer it to any other part of the country; and accordingly the plain from Altona to Blaukeneſe is ſprinkled with villas, pleaſure-grounds, handſome buildings, plantations, and Engliſh Gardens. That part of the ground which is not thus occupied by rich individuals, is left open for the amuſement of the middling claſs.

On moſt of thoſe country-houſes and pleaſure-grounds, electrical conductors have been erected. You know that Reimarus, in his laſt publication on this ſubject, has expreſsly written againſt the pointed conductor, affirming that it was only neceſſary to encompaſs the building with metallic particles ſuſpended or connected together, and that he did not ſee the uſe of inſerting the conductor into the ground, it being ſufficient, according to him, if it touched the ſurface. It is certain that a houſe, incloſed in a cage of metal wire, plates, or bars, would be entirely ſecure from all the effects of lightning.

According

According to this theory, the conductor would then be rendered defenſive, and not offenſive: but I am not yet quite certain that the new ſyſtem ſhould be preferred to the old one. It ſeems that ſome are alarmed leſt the ſharp pointed one ſhould invite the electric current, which otherwiſe might paſs over the houſe without injury. Should the electric cloud, however, be charged with ſuch a maſs, that the paſſive one cannot convey it off, the conſequence will be an exploſion; but in ſuch a caſe, the ſharp pointed one would not be attended with an exploſion more ſtrong or dangerous; ſo that if it did not diminiſh, it would not increaſe, the danger. As to the reſt, long and certain experience can alone determine, which of the two ought to obtain the preference. All the conductors, which I have ſeen in and near Hamburgh and Altona, are ſharp pointed, and are inſerted a few inches into the earth. In Hamburgh, the lightning ſtruck the

bottom of a houſe, which was furniſhed with a conductor; but from the account, I cannot aſcertain whether or not it was local. It appears to me, that there muſt have been ſome defect in the erection of the conductor, or that the houſe muſt have been very large; for the ſecurity ariſing from the pointed one, does not extend beyond a circle of 60 or 80 feet at fartheſt.

I next went to ſee the Senator Voght's extenſive farm in Flotbek, which is laid out with the greateſt rural taſte. The proprietor received me with the utmoſt politeneſs, and I was accompanied through the grounds by a young German, who reſides under his hoſpitable roof. The houſe is built and furniſhed with great elegance. There I found many choice ſpecimens in natural hiſtory, and ſeveral mathematical inſtruments; among which was a machine, the only one of the kind I ever ſaw, calculated to illuſtrate experimentally the phœnomena of the tide in any place, when the moon

moon is in the oppoſite meridian of that place. So far it may be uſeful, as there are many things which may be rendered more clear and certain by an appeal to the ſenſes, than to the underſtanding; and perhaps the theory of the flux and reflux of the ſea is one of them.

M. Voght has erected a large chemical laboratory, which has been well arranged by M. Schmeiſſer, already known to the world by his experiments. This young chemiſt has travelled in many countries, and has even ſoared into the airy regions in a balloon, from the aeroſtatic ſchool at Meudon. I was ſorry that I had not the pleaſure of meeting him, as he had been from home ſome days. I found, however, many traces of his induſtry and ingenuity in the laboratory; where things were diſtinguiſhed by the new ſcientific terms and ſignatures, according to the antiphlogiſtic ſyſtem. I was told that he had diſcovered a new chemical preparation, which kindled

into a flame the inſtant it was thrown into water.

Mr. Voght has annexed a large quantity of land to his country houſe, which is placed under the ſuperintendence of a Scotch farmer; he has alſo a large collection of agricultural implements, with ſtables, ſtalls, &c. all in the Engliſh manner. He has a fine breed of cattle: their dung and urine are collected in a large hole or pit in the ground, and afterwards ſpread upon the meadows and fields. Drains are formed on the ſides of the fields, which are cut very deep, filled with ſtones and covered with earth. As the water runs off between the ſtones, the ſurface can be ploughed and ſowed without any loſs of ſoil. This practice appeared entirely new to ſome; but when the good effects of it were perceived, it began to be univerſally followed. Where the quantity of water, which ought to be conveyed away in this mode, is great, or where it runs with remarkable rapidity, an

open

open cut ought to be made, of a width and declivity proportioned to the body of water to be diſcharged.

Amongſt many other improvements in Flotbék, may be reckoned the introduction of a threſhing machine; but I cannot ſay that it is the beſt I have ſeen: a winnowing machine was placed under the threſhing one. In the courſe of the laſt five or ſix years, threſhing machines have been introduced into many places in Zeeland, with a much better effect than thoſe in Flotbek. Among others which I have ſeen, I need only mention Senator Brink Seidelins' machine in Crikſholm, which threſhes from ſix to eight tons of corn in an hour, and the grain is ſeparated from the chaff, at the ſame time, without the leaſt injury to the ſtraw. Wheat, rye, barley, and oats, are threſhed with equal perfection and diſpatch. The large threſhing machines are very good of their kind; but they take great force (commonly four horſes) to work them, occupy much room, and require

require a large and ſtrong houſe, coſt from five to ſeven hundred rix-dollars, and in ſhort, are calculated only for large farms. To render them uſeful to ſmall farmers ſhould be the great object; ſo that they take up leſs room, coſt leſs money, and be worked with leſs force. Some ſmaller machines have been already introduced with ſucceſs; and the ſociety of rural œconomy has held out a handſome premium for the beſt invention of this latter kind.

Mr. Vaght has alſo laid out an excellent nurſery, of ſuch kind of trees, &c. as may be uſeful to the country people, and of ſuch foreign ones as he thought would bear our climate. This plantation is found to be extremely uſeful; as it furniſhes the farmers with plants. There are many other extenſive farms and plantations throughout the country, beſides ſeveral plantations and copſes, with agreeable walks in the Engliſh taſte.

I was not lucky enough to meet with Senator

Senator Kirckhoff in Hamburgh; he has an excellent collection of philosophical instruments, executed by the best English artists, and which were formerly used in courses of lectures in experimental philosophy, the diffusion of which he is anxious to promote. I also found that Doctor Reimarus and Professor Busch, during my stay in Altona, had set out on a visit to their friends in Holstein.

LETTER

LETTER II.

JOURNEY FROM ALTONA, THROUGH OSNABURG AND MUNSTER, TO WESEL.

Sluices—Roads—Cottages of the Boors—Soil—Diſagreeable travelling in the Hanoverian territory—Interrogations of the Pruſſian Guard—Plantations of Wood in Hanover—Pruſſian Soldier very ſeverely puniſhed for begging—Peaſants uncomfortably ſituated—Oſnaburg a dirty Place—Hanover little improved for the laſt Twenty-two Years—Denmark very much, owing to the excellent Meaſures of its Government—The Bonds of Servitude relaxed—Yet agricultural Improvements not complete—Recapitulation of them—Manufacture of Linen and Tobacco—Coal-Pits worked by the Crown—Fine Valley from Lengerick

Lengerick to Munſter—Munſter a neat Town—Superſtition of the Inhabitants—Feudal Syſtem ſtill oppreſſes Oſnaburgh and Munſter—Boors miſerable Slaves—Feeble Manufactures at Dorſten—Converſation with Emigrants of Rank.

ON the 6th of Auguſt, I left Altona, and croſſed the Elbe to Harbourg. This ſhort paſſage is very pleaſant; as it affords a proſpect of many fruitful, highly cultivated and populous iſlands, lying in this majeſtic river, which flows from the Elbe to Harbourg, (a well fortified town) through ſeveral ſtone ſluices, placed in very proper ſituations, and well conſtructed. A ſluice forms before the town an excellent baſon, which would make a very convenient harbour; but Hamburg, Bremen, and Altona are its ſuperiors in point of ſhipping, and are likely to continue ſo; as this great river glides away in a number of collateral cuts or canals.

I intended to take the ſhorteſt road to Paris,

Paris, through Oſnaburg, Munſter, and Bruſſels. From Harbourg the uſual route is through Welle, Wiſſelhöven, Rehde, and Nienburg. The great roads run through ſand and heath, and are worſe than any of the highways in Jutland.

The cottages of the boors are built like thoſe in Holſtein; the doors being in the gable-end, the barn is in the middle, and the ſides are partitioned off for the cattle; and one of the ends is ſet apart for the uſe of the family. Very few of thoſe cottages are furniſhed with a funnel or chimney, ſo that the ſmoke diffuſes itſelf over the whole houſe.

Moſt of the farm houſes are encircled with neat plantations of oaks, which thrive very well in ſandy ground, a circumſtance which induces me to think that there is good earth a little deeper, or that at leaſt that it is not ſuch a ſtony maſs as is found beneath the ſurface of ſuch grounds in Jutland.—Thoſe little oak plantations extend almoſt over all the plains to the Rhine,

and

and add very much to the rural charms of the peaſant's habitations.

A poſtmaſter reſides at every ſtage, and is always prepared to forward you in your journey. But, although the expence is moderate, the way ſeems very tedious;—ſo that to travel a Daniſh or a German mile requires at leaſt two hours. The poſt-boys are ſo ſurly and avaricious, that if you were to give them three or four marks for drink-money, as it is called, at the end of every ſtage, which ſeldom exceeds three miles, yet they would ſcarcely think it worth while to thank you. It is of no uſe to complain to the poſtmaſter;—ſo that I would adviſe every traveller, who is condemned to paſs through the Hanoverian dominions, to lay in a large quantity of patience and *ſang froid*.

I rejoiced when I was told that we had paſſed through the worſt part of the road, and that we ſhould ſoon come to a cauſeway, which was neither more nor leſs than a road cut through ſand, and covered at intervals

tervals with ſtone and gravel, which of courſe rendered it more heavy.—The only advantage it could boaſt over the heath, which we had paſſed, was, that there was leſs danger of breaking a leg or an arm. Notwithſtanding all this, the expence of the carriage is very high. Sometimes the unruly poſt-boy will quit the cauſe-way to drive over the heath, and is only to be brought back by good words or money, and ſometimes both fail of the deſired effect.

At Rehde, we paſſed over the river Aller, in a very convenient ferry-boat, which conveyed horſes and waggons at the ſame time, like thoſe at Jægerſprüs and Frederick's-ſund. The line of demarcation now commenced; and here for the firſt time we met the Pruſſian centinels or guard, to whom we were obliged to give up our names, to tell whence we came, and whither we intended to go. I paſſed through a long line of demarcation, which was alternately guarded by Pruſſian and Hanoverian troopers. The officers treat travellers with great

politeneſs,

politeneſs, and ſcarcely detain them a moment.

Nienburgh is an inland town, which carries on ſome trade in proviſions and gin. Here I ſaw large herds of young ſwine, the fleſh of which is tranſported to Lower Bremen, by the Weſer. The ſandy ſoil is fruitful, and very well cultivated for about a mile round the town. Then the heath again makes its appearance. Both roads, for about a mile, are planted on each ſide with young fir, birch, beech, and ſome oak. Theſe plantations are very well laid out, and the trees are all of a promiſing growth, ſo that we ſee the regulations for this purpoſe, in Hanover, have been planned with good effect.

The road to Solingen and Diepholtz is covered with ſtunted heath, and a kind of flying or drift ſand. A battalion of Pruſſians is quartered in Solingen; and juſt as I entered the town a ſoldier was puniſhed, on a charge of having begged in the neighbouring villages. The officer himſelf, who had

had all the appearance of a gentleman, ſeemed to think the puniſhment too ſevere; but the articles of war would not permit him to mitigate it. Though this law may appear very hard, yet it is founded in neceſſity; as begging is often found to be a mere pretext for deſertion.

In thoſe parts, the houſes of the boors are very indifferently built, and worſe furniſhed; whence it is eaſy to conclude, that the ſituation of this uſeful claſs of men is far from being comfortable. The flying ſand runs to Diepholtz, where ſome Hanoverian troops lay, as well as on the ſide of Diepholtz, on the road to Boomte. About a mile from Oſnaburg there is a ſtone cauſeway, which is far from being good, though it is undoubtedly preferable to the ſandy road. This town has very little to invite the eye of a viſitant, the ſtreets being narrow, crooked, and dirty. There is only one houſe built in the modern taſte. It contains a garriſon, with two battalions of Pruſſians, and one of Hanoverians.

Doctor

Doctor Olbers of Oſnaburg is in ſome meaſure known as an aſtronomer, having made different obſervations on comets, and written a large treatiſe on the ſubject, with a very uſeful abridgment of the whole work.

It is now two and twenty years ſince I travelled through Hanover and Oſnaburg; and, as far as falls within the view of a traveller, it does not appear to me that the progreſs in agriculture has been great, at leaſt not in thoſe parts through which the road is carried. It is, however, poſſible, that in other parts, eſpecially thoſe which are more fertile, the plough has been more attended to. I only ſpeak of what I have ſeen. I found very little improvement in the cauſeways or ſand ways, as they are called, for the convenience of the travelle. or the waggoner.

When a perſon compares the condition between Sealand, Fühnen, Falſters, Laalands, Langelands, and Jylland, 22 years ago, with the preſent ſtate of theſe provinces, it muſt

muſt yield the higheſt pleaſure to every benevolent mind, to mark the progreſs which Denmark has made in the intervening period. The roads were ſcarcely paſſable. Barren waſtes preſented themſelves in every direction. The little ſpots of land which were cultivated, after lying fallow for a year, ſcarcely produced a moderate crop of corn; and meadows and paſture grounds were in the ſame ſtate. At preſent, the roads interſect the country in almoſt every direction; the ſcattered cottages are collected into hamlets; and the face of the country is entirely changed for the better. In many places, it is true, bond ſervice prevented the peaſant from devoting the ſmalleſt time or labour to his own little field; and ſome acted on that falſe and miſerable maxim, *That it was better to encreaſe than to diminiſh the number of large farms.* The boors were localized, and confined to the very ſpot on which they firſt drew breath.

The government ſaw and lamented the impolicy

impolicy and inhumanity of ſuch a ſyſtem; and, in 1768, the miniſtry began to remove theſe impediments, by the improvement of the commons, which the very law itſelf impeded. The government publiſhed an ordinance, in which the advantage of incloſures, and the cultivation of the ſoil were ſet forth; but this had not the force of law. Proper land ſurveyors and land inſpectors were appointed, to make allotments of the different parcels of the commons, ſome of which were ſcattered here and there. But prejudice and ſelfiſhneſs preſented difficulties which gave riſe to ſuch diſcontents and ill-will, as threatened to fruſtrate the beſt digeſted plans, and to render every attempt of the kind abortive. It required the ſtrongeſt arguments and examples, particularly on Bernſtorff's manor and Kolding houſe, to convince the peaſants of the utility of the meaſure, and that it was much better that each ſhould have have his lot to himſelf, than in common with others. As the advantages of the meaſure began to

be diſcovered, moſt of the peaſants wiſhed that their portions ſhould be meaſured off; ſo that each might be put in poſſeſſion of his own.

By an order on the 23d of April 1781, his majeſty, through the exchequer, commanded an entire abrogation of the partnerſhip in commons and waſte lands; ſo that as ſoon as the allotment deſired by any one ſhould be made out, the reſt ſhould not be allowed to object to it, but that a general plan ſhould be laid down, which ſhould include the whole, a meaſure which became afterwards generally agreeable.—This difficult taſk was impoſed in too great haſte. It required the greateſt conſideration to form rules for the ſurveys and taxation, and for the arrangement of the whole ſcheme. Many land ſurveyors and land inſpectors were employed, and each was previouſly obliged to give a ſpecimen of his qualifications for his department. From the moment that this important meaſure was adopted, it was carried on with the greateſt

greateſt zeal, and with unabating induſtry; ſo that about two-thirds of the peaſants of Denmark at this moment feel its beneficial effects. A number of theſe little farms are now in good heart, and many of the peaſants enjoy them rent free.

Government itſelf, in Copenhagen, Frederickſbourg and Kronbourg, has ſet a laudable example. The bonds of ſervitude are now relaxed; and bond ſervice is limited in every part of the kingdom. In ſeveral provinces, particularly in Jylland, many of the great landed proprietors have let their eſtates in ſmall farms, to the peaſants, at an eaſy rent. The pleaſing reſult is viſible in almoſt every place you ſee, and in every countenance you meet. Whatever road you take through Denmark, you ſee commodious and well built cottages, gardens, cultivated grounds, rich meadows, fine cattle grazing in clover fields, and, above all, a hale, healthy peaſantry. Yet, after all, agriculture is far from being brought to that height of proſperity it is

capable of in Denmark; of which, however, there is every proſpect that it will one day arrive.

When we reflect that all this was begun in the auſpicious reign of Chriſtian the Seventh, who had the power and the will to promote ſuch uſeful regulations, and when we alſo reflect on the prejudice and obſtinacy of the peaſants, who ſhut their eyes to their own intereſt, and ſeemed to hug their chains, it is ſurprizing that even the patience, prudence and wiſdom of the government could ſurmount all theſe difficulties, the removal of which has produced the happieſt effects over all Denmark. Such another inſtance is not to be met with in the œconomic hiſtory of any other ſtate. That in the ſpace of forty years, barren waſtes ſhould be divided and converted into fertile fields; that every peaſant ſhould have his own farm, and build his own houſe; that bond ſervice ſhould be limited, or altogether aboliſhed; that large farms ſhould be divided into ſmall ones;

that

that the chains of ſervitude ſhould be relaxed; and that ſome peaſants are become the lords of that ſoil which they formerly cultivated as bondmen!—It is with pleaſure that I look back to my youthful days, when, from 1765 to 1767, as head ſurveyor of the exchequer, I had ſome ſmall ſhare in the original execution of this important work.

After this digreſſion, to which I was naturally led by a pleaſing compariſon, I beg leave to reſume my journey. From Oſnaburgh to Lengerick are two miles of the worſt road I ever travelled, part of it being through a flat clay, and the reſt rugged hills and hollows; and the way itſelf ſo narrow, that it is with difficulty one carriage can paſs another.

The firſt of theſe two miles belongs to Oſnaburgh, and the other to Pruſſia. Moſt of the mountains are covered with fine plantations of birch, fir, and beech; but it is only in ſome places that the beech finds a congenial ſoil. One of the mountains near

Lengerick commands a charming proſpect. This neat little town belongs to Pruſſia, and is united to the province of Tecklenburg. There are different manufactures of linen and tobacco eſtabliſhed in it, ſome of which employ ſixty hands. In the vicinity, the fabrication of linen is carried on to ſome extent, the article being vended at Bremen; and the raw materials. Hemp and flax are growed in the ſurrounding country. There are beſides ſome coal pits, which are worked by royal authority. A ton of good coals coſts four good groſchen (that is about ſixteen pence Daniſh) at the pit. The carriage may amount to as much more for every half mile. Many ſtrata of this valuable foſſil have been diſcovered, but have not yet been examined or worked.

The road from Lengerick to Munſter runs through one continued flat or valley, covered with rich verdure, enlivened with farms incloſed and well cultivated, and adorned with copſes of oak, beech, fir and pine. The roads are bad from the nature of

of the materials; and the mode of repairing them is ſtill worſe.

As ſoon as you enter Munſter, you perceive a number of crucifixes, ſmall chapels, and holy images on the road ſide. The town of Munſter is tolerably neat and well built. The pavement is very good, and many of the buildings are in the modern taſte; but the churches are all Gothic. The cathedral is very fine, and decorated, in the catholic manner, with ſeveral little altars, and ſmall chapels. In Saint Clara's church, I obſerved a printed paper ſtuck up; ſetting forth that, on Sunday the 12th of Auguſt, high maſs would be celebrated, to implore Heaven to move the hearts of potentates, for the preſervation and extenſion of the Catholic faith. There was alſo an aſſurance held out, that the pope would remit all the ſins, which the hearers of this maſs had committed, for the laſt two months! I ſaw another of thoſe papers poſted up in the cathedral. Hence it is eaſy to perceive, that the ſpirit of the church of Rome is

the ſame now that it formerly was, and that it is held no ſin to commit any crime which tends to enlarge the boundaries of its empire.

Munſter, during the ſeven years' war, was well fortified ; but the works are nearly ſinking into ruins ; the rampart is planted with ſeveral rows of trees. The glacis and the covered way, as well as the foſſé, are now ornamented with gardens and ſummer houſes, for the enjoyment and recreation of the inhabitants ; ſo that hereafter the fear of a ſiege need not be apprehended, or any of the fatal conſequences which ſuch an event never fails to produce. The broad ſhady walks, on the rampart and about the town, are ſo well laid out, that I know not of any place which can boaſt ſuch a number of inviting promenades. The town belongs to the line of demarcation, and beſides the troops which belong to Munſter, ſome Pruſſian battalions are quartered in it. One of the generals of that nation gave a ſplendid ball to the ladies and gentlemen

of

of Munſter, in return for the kind and polite reception which the Pruſſian officers had experienced.

The feudal ſyſtem continues, in all its oppreſſive rigour and extent, in Oſnaburgh and Munſter.—The boors are ſlaves, and toil from morn till night. They are obliged to give an unuſually high rent for a little ſpot of ground. When one of them dies on the ſame, the lord of the manor, or the *beneficiarius*, ſeizes on the half of his little property; the ſame happens if he ſhould not die on it, unleſs he has ſcraped as much together as will enable him to purchaſe his freedom. It is eaſy to ſee what a drawback this muſt be on the ſpirits and induſtry of thoſe miſerable beings, independent of the birth which it gives to perpetual vexations and heart-burnings.

I left Munſter on the 10th of Auguſt, and found the roads very bad; ſtumps and trunks of trees or faggots are thrown acroſs each other in the miry places, otherwiſe they would be impaſſable. This road leads

to Dulmen, a poor village. The ſoil is very ſandy and hungry all the way to Dorſten; then the land begins to be ſomewhat more fertile, and produces a great deal of graſs. Dorſten, like moſt trading towns of the kind, is peculiarly fortified in the old manner, with a wall, ſquare, and round towers or baſtions, and a foſsé. In the ſeven years' war, the French took poſſeſſion of it, and planted ſix or ſeven pieces of cannon on it. Prince Ferdinand attacked it with about a thouſand men, and, after three attempts to ſtorm it, was beat off. The town was ſet on fire in different places, the effects of which may be ſeen to this day: he took it, however, at laſt. There are ſome cotton and linen manufactories erected in the town, but they are ſtill in a very feeble ſtate. The poſt-houſe is the only inn in the place; and bad enough it is. I dined with eight emigrants from Liege, amongſt whom was an ex-canon, nephew of the late biſhop of Liege. He was dreſſed in a ſhort green veſt and ſtriped pantaloons, and had a kind of leather

leather cap or caſket on his head. The reſt were better equipped; and it was eaſy to ſee that they had been perſons of ſome rank. As it was a faſt day, their dinner conſiſted of oil, fiſh, eggs and meal, the whole ſo bad, that I really thought the keeneſt appetite would reject ſuch fare. After dinner we began to converſe with greater caſe and freedom. We touched on the fate of the French princes. They ſaid that all ſtates, kings, and princes ought to unite with weapons in their hands, to arreſt the progreſs of the French revolution, to overturn the republic, and to reinſtate the princes. It ſurprized me not a little, after what they had ſaid of the ſplendour of their former days, that they could remain for a moment in ſo miſerable a village.

LETTER III.

JOURNEY FROM WESEL ACROSS THE RHINE, AND THROUGH PART OF BELGIUM TO BRUSSELS.

Weſel, a neat Town—Paſs demanded—Fly Boat on the Rhine deſcribed.—French Officers reported to be rude, but found civil—Gueldern, a ſmall genteel Town, oppreſſed by the French—Prieſts forbidden to keep the uſeful regiſter of births, &c.—Fine plantations of wood, and other improvements—Curious ſluice uniting the Maes with two other Rivers—Cloiſters at Maaſſyk ſold or converted into Barracks—Crucifixes, &c. carried off—Fine Chimes, eſpecially at Tirlemont—Country ſtill exhibits remains of Proſperity, and why—Louvain Univerſity, &c. diſſolved—Bitter Complaints there of French impoſts, which

are

are not attended to—Cauſeways, or paved roads, deſcribed.

I CAME to Weſel on the afternoon of the 11th of Auguſt. In this very neat and well fortified town, my paſs, for the firſt time, was demanded by the officer on duty. Having caſt his eye over it, he returned it to me immediately. I was told ſo many ſtories of the rude conduct of the French officers to foreigners, in particular diſtricts, that I was almoſt afraid to ſet my foot on the territory of the republic, which now began on the other ſide of the Rhine. Though I am not fond of cockades, I was adviſed to wear one; as that badge was alledged to render travelling ſafer than it otherwiſe would be.

The next morning rather early, I croſſed the Rhine, on what is called a flying bridge. Perhaps you may form ſome idea of the conſtruction and operation of it from the following deſcription. In fig. 1, A, is a projecting wharf, on the Weſel ſide, and B, a

B, a ſimilar one, on the other ſide of the Rhine. F is a large boat, which rides by two anchors, in the middle of the Rhine; E, D, and G, are boats which do not lie at anchor, but are faſtened together by cables which run through their maſts; G is the large ferry-boat, of a peculiar ſtructure, which deſcribes a circular arch, of which F is the centre, and which terminates at the wharfs A and B. When you would croſs from A to B, the direction of the water being from M to N, or from P to Q, the rudder muſt be kept in the direction of G H, which, according to theory, ſhould form with the keel of the veſſel an angle of 54° 44′. The ſtrength of the current repreſented by H I is reſolvable into two forces. The firſt I K parallel to the plane of the rudder G H, and the other K H or I G perpendicular to it. The laſt alone will turn the veſſel, and cauſe it to deſcribe the circle M n o p. In this manner I croſſed the Rhine in little more than a quarter of an hour. But the rudder muſt be kept in

an

an oppoſite direction, in order to paſs from the French to the Pruſſian ſide.

I have already obſerved, that, on the Pruſſian ſide, they alarmed me very much with accounts of the inſolence of the French Commiſſaries, who, it was ſaid, not content with a long examination of one's paſs, examined your trunks, and toſſed every thing about; but, in juſtice I muſt declare, that I found their conduct quite the reverſe; and that I never met with perſons in their ſituation, who behaved with more politeneſs and attention. On the banks of the Rhine, on the road to Geldern, not one of the French officers even ſo much as deſired to look at my paſs, though I offered to ſhew it to them. When I came to Geldern, my trunks were examined. But I travelled through Belgium and France, without any viſitation of the kind, even at the barriers of Paris; ſo that I have not the leaſt cauſe of complaint on that ſcore.

The next ſtage is Geldern, a ſmall genteel

teel town; the inhabitants of which had little reaſon to be pleaſed with their new maſters: for, independently of what they had ſuffered from the ſucceſſive influx and billetting of ſoldiers, the French demanded 100,000 livres, which they promiſed to take in proviſions, and contributions of an eaſy nature; but, contrary to all expectation, it was demanded and paid in ready money, in addition to all the aids which were paid to the Pruſſian Government. A new land tax was impoſed, the preſſure of which was very ſeverely felt. In Geldern there are two Catholic churches, two monaſteries, and two nunneries. The rectors, or pariſh prieſts, were forbidden by the municipality, to regiſter births, deaths and marriages, which was conſidered as a prelude to the extinction of the ſacerdotal office, and the ſhutting up of the churches.

"Tontines, life-rents and annuities, &c. ought to be regiſtered, and properly atteſted, and when this office was taken away from the clergy, it is to be lamented that other perſons

ſons were not appointed to fill it. In towns it would be eaſy to find ſuch perſons, but in the country it would be rather difficult. At an eaſy diſtance from Geldern there is a large grove, and a fine cloiſter called Zante.

On leaving Geldern, you meet with a large common covered with heath, about two miles in length and as much in breadth. There are many encloſures, however, on this heath, each from forty to ſixty acres. They are planted with fir, oak and birch. Some of the plants are old, others younger, and ſome very young, but all of promiſing growth. It would be difficult, perhaps, to meet with ſuch plantations and riſing woods in any other place. They reflect a great deal of honour on the former Pruſſian Foreſt Board, and are ſo many proofs of its activity and penetration.

Beſides theſe, there are many ſpots from ten to twelve acres in extent, encloſed for the purpoſe of building and forming ſettlements, and which promiſe to repay the toil and induſtry of the cultivators. They have already

already begun to grub up the heath, to collect it into ſmall heaps, and to reduce it to aſhes, with which they manure the ground. Theſe little encloſures produce rye, buckwheat, and potatoes of an excellent quality. What delight muſt fill the heart of the traveller as he paſſes along, and to ſee that the Pruſſian adminiſtration has turned its attention to the amelioration of the condition of the people? This fine province, in a ſhort time, will be ſo highly improved as to vie with any other whatever.

Thoſe heaths juſt mentioned, are encircled with many fertile plains, handſome farm houſes, and buſy trading towns, among which Venlo deſerves to be diſtinguiſhed. The next ſtage to Geldern is Degelin, which is followed by Ruremond, a large well built town, to reach which you muſt paſs the river Ruren, or Roer, and in a few minutes after, the river Maes. Theſe rivers are united by a curious ſluice, very finely executed. The road ſtretches along the banks of the Maes to Maesſyk, an ill

built

built town, in which, however, there were two cloiſters. One of thoſe ſanctimonious erections was converted into a barrack, and the other was ſold for 100 louis-d'ors. The inhabitants are ſuch good Catholics, that they ſolace themſelves with the hopes of better days; that is, they expect the monks to return, and reſume their former ſituations. The cloiſters and churches in thoſe conquered countries were generally ſold for a mere trifle, and the republic has profited very little by the ſales.

The roads, at a diſtance from the Rhine, are very good. No induſtry ſeems to have been ſpared by the former government to make them, and keep them in good repair. There are ſmall chapels along the road, with holy images, but all the crucifixes were carried off. There is not a croſs to be ſeen on the ſpires of the churches, either in town or country.

Reekom, Tongeren, St. Tron, and Tirlemont, are the ſucceſſive ſtages from Maesfyk. Tongeren and St. Tron are rather neat.

In

In almoſt all the towns of any note, there are chimes, which play at leaſt every hour. The beſt that ever I heard are in Tirlemont; the bells have a very fine tone, and are always in good order. On this ſide of the Rhine, it is not a little ſurpriſing to ſee thoſe lands, which were formerly parcelled out to Pruſſians and Auſtrians, ſtill exhibit ſo many remains of opulence and proſperity, in handſome trading towns, and well-cultivated farms. The cauſe may be aſcribed to the natural fertility of the ſoil, high cultivation, manufactures, the many rivers and canals which interſect it, the Dutch navigation, and the quantity of proviſions which it conſumes; all which have enabled the farmer to diſpoſe of his produce to great advantage.

From Tirlemont I came to Louvain, formerly known by its univerſity, and the part which it acted under the redoubtable diſpleaſure of the Emperor Joſeph. The univerſity and the cloiſters are now diſſolved; and the churches, in which the Catholic

tholic ſervice uſed to be celebrated, are almoſt all ſold. They complain very bitterly in Louvain, of the high taxes which the French government has impoſed. I bought a pamphlet the other day with this title, "*Exposé de la conduite, qu'ont tenus les membres du jury d'équité, pour la contribution perſonnelle du Canton de Louvain, dans la confection de la matrice des rôles.*" In this piece I found copies of all the letters which were interchanged on the ſubject of the perſonal impoſt. No. 1. is a paper of the 24th Ventoſe, 6th year of the Republic, or the 14th of March, 1798, from the *jury d'équité* to the municipal adminiſtration. It begins, by ſtating, that the Canton of Louvaine was ſet down for 90,437 livres, perſonal tax; but that they inſtantly ſaw the impoſſibility of raiſing that ſum in the courſe of a year; in conſequence of which they were going to partition it. They intended to lay a yearly duty of from 40 to 50 livres on ale, vellum, and lace; from 80 to 100 livres on brandies; from 100 to

150

150 livres on herb ſhops and apothecaries; and from 250 to 300 livres on other traders, and on the reſt of the citizens, a proportionably larger tax. They acknowledged that, notwithſtanding theſe new perſonal impoſitions would exceed the ability of the people, yet that there would be a great deficit on the whole. The inhabitants, in reply to this ſevere requiſition, repreſented that the number of troops quartered on them, the ſtagnation of trade and the diſſolution of the univerſity, by which three-fourths of the town's people lived, would render it impoſſible for them to pay ſo high a tax.

No. 2 is a paper from the *jury d'équité*, dated 6th of Prairial, 6th year of the Republic, or the 25th of May, 1798, addreſſed to the municipal adminiſtration. Amongſt many other grounds for the diminution of the perſonal tax, they ſtate that there is no proportion between the taxes of Bruſſels and thoſe of the Canton of Louvain; that the population in the Canton of Bruſſels was four

four times as great as that of the Canton of Louvain, and that the proportion of wealth was as twenty to one.

The municipal adminiſtration of the Canton of Louvain, finding this ſtatement juſt and reaſonable, wrote to the central adminiſtration of the department of Dyle, a letter No. 3, dated the 14th Prairial, 6th year of the Republic, or the 2d of June, 1798, containing the reſult of the eſtimate of the perſonal taxes on the citizens of the Canton of Louvain, founded on the foregoing principles. No. 4 is a paper, dated Bruſſels the 16th of Prairial, 6th year of the Republic, or June 4th, 1798, from the central adminiſtration, containing a total rejection of their requeſt. No. 5 is a freſh memorial from the municipality of Louvain, requeſting a reduction of the taxes. No. 6 is the anſwer of the central adminiſtration of Bruſſels, dated 14th of Meſſidor, 6th year, or 2d of July, 1798, in which the municipality of Louvain is threatened with

ſpecial

ſpecial commiſſioners and military execution. No. 7 is another communication, from the central adminiſtration in Bruſſels to the municipality in Louvain, in which they warned them not to follow the *conſolatory* example of the municipality of Merchten, which had likewiſe complained, and that this complaint was tranſmitted to the Directory in Paris, and thence to Ramel, the miniſter of finance, who diſapproved of the conduct of the municipality, and commanded that the payment of the whole tax which was firſt impoſed, ſhould be immediately enforced. No. 8 is a copy of Ramel's original letter to the central adminiſtration in Bruſſels, dated Paris, the 12th Meſſidor, 6th year of the Republic, or 30th of July, 1798. The reſult of the whole was, that the citizens of the Canton of Louvain were obliged to aſſeſs the tax, and to pay the whole yearly ſum of 90,937 livres; but the preſſure of it was very ſenſibly felt by every individual.

There

There is only one poſt between Louvain and Bruſſels, and that is Curtenberg. The land is well cultivated, and ſtill improves in that reſpect, as you approach Bruſſels. The paved way, which begins at Louvain, is planted on each ſide with trees, a very common practice throughout all Belgium, and which obtains a little in France. Theſe ſtone ways, or cauſeways, which are continued to Paris, are commonly from 40 to 60 feet in breadth. The hollows are filled up, and bridges erected, where there is the leaſt neceſſity, with drains to carry off the water. In the middle of the road, there is a row of ſtones, each of which is commonly a cube of ſix or eight inches. The whole is very well executed; though there may be here and there a little height or hollow, which is always unpleaſant, eſpecially as this inconvenience might be removed by a few ſtones or a little gravel. The breadth of theſe ſtone or paved ways is not always the ſame. On ſandy ground it is ſo nar-

row, that two carriages can ſcarcely paſs each other, and on the ſides are paths for the pedeſtrians. Where the ſoil is tenacious or clayey, it is found neceſſary to extend the pavement to the banks, ſo that there are no foot-ways.

LETTER

LETTER IV.

STAY IN BRUSSELS, AND JOURNEY THENCE TO PARIS.

Bruſſels deſcribed—The Conſeil Souverain plundered—The Viceroy's Palace converted into a Central School—Its Claſſes—Public Library—Churches deſpoiled—Manufactures —— Travelling Carriages drawn by Dogs—Belgians diſlike the new Government, and why—At Mons an Altar expoſed to Sale—Coal Pits—Jemappe—Good Cultivation—Roads neglected—Valenciennes not repaired ſince the Siege—Hoſt of Beggars there, and why—A Shoemaker the Chief of the Municipality at Valenciennes—French Villages mean and poor—Boys and Girls reaping the Harveſt, and why—Three and four wheeled Carts compared—Horſes cruelly treated in France

—Roads neglected, though Tolls high—Bouchain a ſtrong, but mean Place—Cambray neat and clean—French Poſts properly regulated—Chantilly plundered—Approach to Paris charming.

ON the 13th of Auguſt, I reached Bruſſels, the largeſt city in the Netherlands, and a very neat place. The older and lower ſtreets are ſmall and crooked, but the more modern ones are ſtraight and wide, and the houſes are lofty and well built. The public walks are in the Engliſh taſte, and are adorned with alleys and ſome of them with ſtatues: there is alſo a fine park. Theſe, with the archducal court, comedies, concerts, balls, and elegant converſations, rendered the place agreeable, and the environs are very inviting. Bruſſels heretofore attracted a great number of faſhionable Engliſh families. Living having been at all times cheaper here than in their native country, many who had lived beyond their fortune, came hither to repair it.

it. In thoſe days, an Engliſh gentleman could rent an elegant houſe, with ſix or ſeven rooms, for 690 or 700 rix-dollars a year; but ſuch a houſe at preſent would ſcarcely bring 250.

During the laſt conqueſt of Belgium, the fine park was nearly deſtroyed by the French ſoldiers, and would have been totally laid waſte by the Belgic ſans-culottes and terroriſts, had not the French General called in the military, to prevent its total deſtruction. The municipality of Bruſſels have reſtored it to its former beauty, at their own expence.

Among the many buildings in Bruſſels remarkable for magnitude or fine architecture, we are to reckon the former *Conſeil Souverain de Brabant*. The palace of the Archduke, or Viceroy, is remarkably ſuperb. The firſt mentioned edifice is now appropriated to different tribunals, and one of the wings is converted into a priſon. During the laſt invaſion of Belgium, all the ſplendid ornaments and furniture of this magnificent

pile were carried off by a ſet of plunderers, and the iron railing, the ſtairs, and other heavy articles, were ſold. The Viceroy's former palace is now converted into a central ſchool, for the department of Dyle, with a public library. This ſchool is divided into three claſſes. In the firſt, Faucois teaches drawing, Wanderſtegen natural hiſtory, and Leſbrouſſart the Greek and Roman claſſics. In the ſecond, Chiefbreght gives lectures on mathematics, and Van Mons on phyſics and chemiſtry. In the third claſs, Henſchling teaches univerſal grammar, Bouillé the fine arts, Guiſe hiſtory, and D'Outrepont juriſprudence. Van Mons was formerly a judge in the civil tribunal, and is well known by his experiments in the *Annales de Chemie*.

The public library occupies a large ſaloon, with two other apartments not quite ſo large. There is, beſides, a room ſet apart for the palæotypa, or old printed books and manuſcripts, with a reading room. The whole library was collected from the Belgic emigrants,

emigrants, and the libraries of the ſuppreſſed cloiſters. Hence it may be concluded that this collection contains many books of little value. The hiſtorical diviſion is the beſt arranged; but the phyſical and mathematical are mixed together. Among the old printed books and MSS. or palæotypa, there is a large collection of fine copies, which had been found in the libraries belonging to the cloiſters. Many of the MSS. are finely illuminated. Theſe manuſcripts are very valuable, and contain many documents which would throw light on the hiſtory of the Netherlands. I was ſhewn two very beautiful copies of Cicero and Terence on vellum. Laſſerno, the librarian, told me that the library conſiſted of 120,000 volumes; but I own it did not appear to me to contain quite ſo many.

Bruſſels could formerly boaſt of many fine paintings, with which the churches were chiefly adorned; but nearly one third of theſe edifices are now ſhut up, and deſpoiled of their plate and pictures. The

equeſtrian ſtatue of Prince Charles of Lothringen was broken to pieces. It is ſaid, that the Belgic patriots and terroriſts contributed more to this deſtruction than the French, whoſe General prevented it as far as was in his power.

Bruſſels was formerly noted for its manufactures, particularly of camlets, galoon and blond laces, ſilks, clothes, playing cards, tapes, pipes, and earthen ware, of a fine quality: ſome of them are ſtill carried on, but with leſs ſpirit and ſucceſs than in paſt years.

In that city I ſaw, what I thought had been peculiar to Greenland and Kamtſchatka, namely, that it was not uncommon for a perſon to travel in a ſmall light carriage drawn by four, and ſometimes by ſix, large dogs. This mode is alſo practiſed in ſeveral parts of France; but I do not find that it is yet faſhionable in Paris.

It is no ſecret, that the Belgians, in general, do not appear to be very well pleaſed with the new government. That country,

it

it is well known, has been, for a ſeries of years the theatre of bloody wars; though it was very little intereſted in the ſucceſs of either friends or foes. Now the complaint is, that their manufactures are annihilated, and the ſources of ſubſiſtence dried up. The complaint of the weight, and the number, of taxes is ſtill more bitter, and ſome do not heſitate to ſay, that they are double to what they were under the former government, and that they are unequally impoſed. I have already touched on the ſituation of the Cantons of Merchtem and Louvain, in this reſpect. In the mean time, it was the general opinion, that no change or commotion was to be apprehended, while the young men were not enrolled as conſcripts. Experience has ſhewn, that this opinion was well founded; for the firſt diſturbances aroſe in conſequence of the conſcriptions being put in execution; ſo that the French were not content with the meaſure of human woe unleſs it overflowed, or with the effuſion

human blood, unleſs it was wantonly laviſhed.

I left Bruſſels on the 15th of Auguſt. The next ſtage is Halle, the road to which is a very good ſtone cauſeway, both ſides of which are embelliſhed with fine gardens, and highly cultivated fields. From Halle to Braine, the road is in general very good, and improves as you advance. In Braine le Comte, I met with an eſcort of ſix French ſoldiers, conducting as many Belgic prieſts towards the interior of France, whence they were to be removed to the coaſt, and tranſported. The prieſts had a very ſickly look, and were pretty faſt bound. On the other ſide of Caſteau, a barren heath expands itſelf for ſeveral miles, where ſcarcely a ſhrub or tree relieves the eye, except on a very few ſpots laid out in little plantations. The cottages in Braine and Caſteau were built with common field ſtones. The heath reaches to Mezaire, where the ſoil aſſumes a better appearance. This village is built on the road ſide, and extends almoſt to

Mons,

Mons, which is a fortified town, but the works are falling into decay. Here I saw an altar exposed to sale in the market place, with some holy images, and seven pictures. One of the soldiers stepped up, wrote on them, and explained the subject of each to the spectators, who thronged around.

In the plains, there are several fine coal pits. The coals are conveyed by waggons, drawn by six or eight horses, to the neighbouring villages, even as far as Bruffels, and thence conveyed by canals to Antwerp and Holland; as the present war has prevented the importation of this necessary article from England. The road runs to Gemappe, which will be long remembered for the bloody conflict, which took place betwixt the Auftrians and the French, in which the latter charged with the bayonet, and took the numerous Auftrian batteries raised on the heights.

Quivrain is the last Belgic stage. The land is fertile, and well cultivated; almost

all the fields were ſown with clover; and rye-graſs is cultivated with ſucceſs in ſome places. The roads are quite neglected, and if not ſpeedily repaired, will ſoon become impaſſable.—The villages round Valenciennes have ſuffered very much from the war: many of them, particularly the cottages, are quite deſerted.

Valenciennes is the firſt ſiage in Old France. I came in on that ſide which was attacked by the Auſtrians. In the part near the rampart, whole ſtreets and lanes have been demoliſhed, ſome have been levelled to the ground, and others burnt. They have not made the leaſt attempt, ſince the ſiege, to rebuild or repair them. Copenhagen has been more fortunate, in this reſpect. The third part of that city was conſumed by fire, and in leſs than three years, the whole was rebuilt on an extenſive and improved plan, far ſuperior to the former. Fire engines are found to be of great uſe in Denmark, even in villages. I am not certain that fire engines are uſed in France,

France, or in what manner they are regulated and kept up ſince the revolution.

The French villages will loſe, by compariſon, in the eye of the traveller, who has juſt paſſed through the neat and handſome ones of the Netherlands. The firſt moment you ſet your foot in the environs of Valenciennes, you are encircled with a hoſt of beggars, ſo importunate, that they rather demand than ſolicit charity. It ſeems that, ſhortly after the revolution, a number of the youth of both ſexes, engaged in the manufactures, were thrown out of employment, and reduced to the neceſſity of living on the caſual bounty of travellers.

In order to ſhew my paſs, it was neceſſary that I ſhould go to the municipality, and thence to the police-office (*bureau de police*). As theſe two did not ſit at the ſame time of the day, I went to the houſe of one of the municipal officers, a ſhoemaker, whom I found at work in his ſhop. He did not detain me a moment, when I ſhewed him the paſs I had from the French miniſter

ter in Copenhagen. On ſhewing him the royal Daniſh paſs, he ſhook his head; as much as to ſay, That is of no uſe. His dreſs was not very fine, and yet he was the chief of the municipality. In all the other towns, in which there were barriers, or turnpikes, I was only deſired to ſhew my paſs, which the officer never took out of my hands; but this was not the caſe in fortified or garriſoned places, where they examine them very attentively. Formerly they expected a ſmall *douceur* on theſe occaſions, which was ſtrictly forbidden by the laſt French proclamation; *rien de votre généroſité.* I am told they were very well ſatisfied with ten or twelve ſous.

It is not very far from Valenciennes to Frejus, where the French gained a remarkable victory. Here I ſaw a ſmall monument, erected to the memory of General Dampierre. Douay lies farther off: a ſevere battle was fought there in the reign of Louis the Fourteenth; and the French, in order to perpetuate the day, raiſed a monument,

ment on the road ſide, which conſiſted of a ſquare pyramid, about thirty feet high, inſerted in a ſquare pedeſtal, ornamented with pyramids of marble, in *bas relief*, with inſcriptions on each ſide. The pyramid is now ſtripped of all theſe ornaments, which were broken down or carried away. Some ſay that this was done by the Imperialiſts, who could not bear that the defeat of their anceſtors ſhould be thus held out to the view of every paſſenger. But others impute the dilapidation to jacobins and terroriſts, who did not wiſh that even the ſplendid exploits of their fore-fathers, under a monarch, ſhould be tranſmitted to poſterity.

The French villages are inferior, in almoſt every reſpect, to thoſe of Belgium. Moſt of the houſes are built of common clay, and the little furniture betrays evident marks of poverty. Some of them, however, exhibit appearances of proſperity and eaſe. Beſides common corn, clover, horſe-beans, and walnuts are produced in abundance,

abundance, from the kernels of which laſt they expreſs oil.

I ſaw a great number of boys and girls in the fields, gathering in the harveſt, which led me to conclude, that thoſe who ought to have been employed in that taſk, were called to the field of battle. I obſerved that three-wheeled cars, or carts, were uſed inſtead of four-wheeled ones, which in general are very large, and ſometimes require from two to four, and even ſix, horſes to draw them; whilſt one or two horſes will pull a greater load in the former. But I muſt declare, that in no country with which I am acquainted, are the poor working horſes treated with greater cruelty than in France. There can be no doubt, that, where the ground is even, and the roads good, theſe three-wheeled waggons, or carts, ought to be preferred to thoſe with four wheels.

The roads in this part of France are paved, like thoſe in Belgium. Some, however, are better than the highways in that country;

country; though there are many hollows and rough parts in ſeveral places, and although the tolls are very high, all idea of repairing them ſeems to have been abandoned, ſince the revolution.

Bouchain is a very ſtrong fortification; for, by means of the well-placed and finely conſtructed ſluices, the greateſt part of the adjoining country can be inundated at pleaſure; ſo that it would be very difficult to beſiege or take this fortreſs, if well ſupplied with proviſions. As to the town itſelf, its mean buildings have fallen into ruins. The inhabitants ſeem to ſhare the ſame fate, for you meet with poverty in every quarter of it. Along the whole tract from Valenciennes to Paris, there is a ſtratum of chalk-ſtone, which is uſed in decorating the caſt frames of the windows, doors, and gates, and, as you approach the capital, you meet with ſome houſes built entirely with this ſtone inſtead of bricks.

Cambray is well fortified, and is furniſhed with a citadel. The city is well built, neat,

neat, and clean. Throughout the whole, you ſee the remains of wealth and proſperity, for which, no doubt, it is indebted to its famous manufactories of cambric. From Cambray the road runs through Bonavis, Fins, Peronne, (which is fortified) Marche le Pot, Fonches, Roye, Conchy les pots, Carilly, Gournay, Bois le Liheu, and Pont St. Maxenze.

The French poſts are under very proper regulations. The horſes belong to the poſt-maſters themſelves, ſome of whom have near 120, a number of which are always in the ſtable; ſo that you are not detained a moment. The poſt-boy rides on one of the horſes, and goes at a ſmart trot over heights and hollows, rough places and ſmooth, and it is in vain either to entreat him to quicken or ſlacken his pace. This road is a great thoroughfare for carriages of every kind, and at every poſt houſe there is a black-ſmith's ſhop. As ſoon as you ſtop, thoſe ſons of Vulcan come out, and enquire if their aſſiſtance is wanted. The iron axle

of

of my carriage happened to be broken by a ſtone on my way to Pont Maxenze.—They were glad to hear of it, took it out, welded it together, and, in about two hours, I was enabled to reſume my journey. They aſked a louis-d'or, which was not unreaſonable; and it was ſo well done, that it has not failed ſince.

From Pont Maxenze I preferred the road round Chantilly. Here I travelled through a fine grove of oak and beech, with much underwood of forward growth. This narrow way is bordered with lofty trees, whoſe ſpreading branches form the moſt agreeable and grateful ſhade, eſpecially from the noon-tide ſun.

Chantilly belonged to the Prince of Condé, and is well known for the beauty of its architecture, and the enchanting walks and plantations, parks, and pleaſure grounds around it. The jacobins have nearly demoliſhed the fine park walls, and cut down the trees which ſhaded the walks. All the internal decorations of the caſtle,

the

the paintings, looking-glaſſes, tapeſtry, the valuable cabinet of natural hiſtory, library and all, were plundered; ſo that the empty ſhell is all that remains of its former ſplendor. The mob cut and carried off the heads and arms of the ſtatues, which the Prince had been ſo many years in collecting. In many of the rooms are yet to be ſeen part of the ſmall cells, in which thoſe who were doomed to the guillotine were immured, during the bloody reign of the terroriſts.

The roads begin to improve, as you approach Paris. The ſucceſſive proſpects on every ſide, ſeem to vie with each other in richneſs and variety.—They ſurpaſs whatever imagination can conceive. The mildneſs of the climate, groupes of vineyards, highly cultivated orchards and kitchen-gardens, all contribute to render the ſcene delightful; and peaches, apples, pears, plumbs, cherries and walnut trees flouriſh in the open fields, in the greateſt abundance.

From

From Chantilly I travelled through Luſarche, Echöuen, and St. Denis, and arrived in Paris, in the afternoon of the 18th of Auguſt.

LETTER

LETTER V.

COURSE OF INSTRUCTION IN THE PRIMARY, CENTRAL, AND POLYTECHNIC SCHOOLS.

Primary Schools well conducted in Paris, but not in the Country—The Revolution subverted the beſt old Inſtitutions—Normal Schools—Fault in conducting them—Sciences taught in them—Journal of the Lectures and Debates in them—Diſſolution of them—Regulations of the Central Schools—School of the Four Nations—Scientific Courſes in it—Second and third Central Schools—Liſt of Departments with and without Central Schools—Defects in thoſe already eſtabliſhed—The French ſhew no wiſh to learn foreign Languages—Morality and Geography not taught in the Central Schools—Ancient Literature little attended

tended to in them—The Pupils in them but ſuperficially inſtructed—Some of the Teachers ill qualified—Polytechnic School—Courſe of Study in it—Philoſophical Apparatus, Library, and Collection of Models belonging to it—Public Examination of the Students.

IN the account of Paris which I intend to give, you muſt not expect me to confine myſelf to chronological order; but I ſhall arrange in my journal all that I intend to ſay on the different ſubjects, under their proper heads—a method which, in ſome meaſure, will prevent repetition and diſorder.

I ſhall begin with public inſtruction. The firſt are called Primary Schools, which anſwer to our common ones, where reading, writing, and arithmetic are taught. There are many private inſtitutions erected in Paris, the object of which is to prepare youth for the higher claſſes; ſo that they may be tranſplanted from thoſe nurſeries to the

the central ſeminaries. Theſe private inſtitutions in Paris are in general conducted in a very proper manner; but I cannot ſay ſo much of thoſe in the provincial towns, and in the country. Formerly the clergy claimed the excluſive right of inſtructing youth. The pariſh prieſts were allowed lands and houſes, but being now deprived of theſe benefices, they are obliged, as their only means of ſupport, to teach ſmall ſchools, where the country people pay for the education of their children; but thoſe ſchools are ſo little frequented, that the riſing generation may be ſaid to grow up without any inſtruction.

We may conclude, that the primary ſchools were very much neglected from the ſpeech which Bitaubé, the preſident of the National Inſtitute, delivered in the Council of Five Hundred, and the Council of Ancients, on the ſecond complementary day in the 6th year of the Republic, (or the 18th of September, 1798) I cannot in this place omit a paſſage in it, which reflects ſo much

much honour on the National Inſtitute, and the orator who pronounced it. (*Comte rendu et preſenté au corps légiſlatif, le* 2d *jour complémentaire de l'an* 6, *par l'Inſtitut National des Sciences et Arts. Paris an* 7, pag. 186 et 187.) "But,—citizens repreſentatives, when I laid before you the labours of the phyſical and mathematical claſſes, I ſhould not have departed from the principal object, if I had, in addition to theſe claſſes, ſubmitted to your conſideration the wiſhes which impreſs the whole National Inſtitute, and the whole nation, that the firſt ſchools for the inſtruction of youth ſhould be thrown open, and that the Central Schools ſhould not be deprived of their firſt and firmeſt foundation, the PRIMARY SCHOOLS. I have already acknowledged, that this meaſure is very dear to your hearts. The republic has cauſe to lament, that this important work has been ſuſpended for a long time, from a ſeries of unfortunate circumſtances. We truſt, therefore, to your wiſdom, that you will fix their exiſtence on a firm and immutable

baſis. The members of the Inſtitute feel it their duty to declare the lively intereſt, which they take in every part of your deliberations and labours. The members of your Inſtitute are deeply intereſted in the fate of theſe ſeminaries, and they are anxious that ſuch meaſures may be adopted as will tend to multiply and fix them on a ground that will ſhortly evince the wiſdom and utility of the meaſure.—But, citizen repreſentatives, you know how important a thing it is for public order, the maintenance of the laws, and the correction and purity of morals, that thoſe, whoſe fathers you are, ſhould be early inſtructed, and uſefully employed. You are called on to watch over a race of young plants, which are now drooping—and, if not ſpeedily revived, will fade away. The happy effects of the central ſchools are already experienced in different departments; the happy conſequences of other public inſtitutions are daily diffuſing themſelves. It is in your power to remove the misfortunes of which

we

we complain; ſo that an active, aſpiring, and ingenious people will have the pleaſure of ſeeing their youth return once more to inſtruction, when it is held out to them."

The preſidents of both Councils in their anſwers, pronounced a panegyric on the Primary Schools. The preſident of the Aſſembly of Ancients ſaid (*Compte rendu*, p. 202.) "The Council participates in the ardent wiſhes, which you expreſs for the advancement and regulation of the primary ſchools. They are well worthy of the attention of the Legiſlature, and we receive them with additional pleaſure, becauſe they come recommended by the Council of Five Hundred, which will not fail to watch over theſe young plants, which you have recommended with ſo much ſolicitude."

Time will prove whether it would not redound more to the advantage of the French nation, that theſe patriotic views ſhould be carried into execution, than the conqueſt of entire provinces. Without in-

ſtruction, the riſing generation will have to lament the fatal conſequences of ignorance, immortality, and unbridled licentiouſneſs.

In conſequence of the Revolution, every thing was changed, and even the beſt inſtitutions under the monarchy were ſubverted, or annulled, with the exception of the French College in Paris, which has undergone no change. It was found neceſſary, that other inſtitutions ſhould be ſubſtituted in the room of thoſe that were aboliſhed, and to which they gave the name of NORMAL SCHOOLS. In purſuance of the decree of the 24th Nivoſe, 3d year of the Republic, or the 15th of January, 1795, the National Convention ordained, that profeſſors and teachers ſhould be eſtabliſhed, over all the Republic, and they gave the general name of Normal Schools to thoſe nurſeries, to which men of clear underſtanding only were to be appointed, to prepare youth for the higher ſchools. There was one fault however in them, the ſame which was complained of in thoſe in which

which lectures were read, and that was, that the learner ſhould write a quick hand to take down the lectures; ſo that it was neceſſary he ſhould learn ſtenography, or ſhorthand, as theſe lectures were to be immediately printed in a journal. In the Firſt Sitting, or Aſſembly, the profeſſors only ſpoke; in the ſubſequent ones, the ſubject was reſerved, and all the pupils in ſucceſſion were at liberty to deliver their opinions on it. They could put queſtions to the profeſſors, and the profeſſors, in their turn, could queſtion them; ſo that the ſubject of enquiry was generally ſifted to the bottom; as there was no reſtraint on the freedom of diſcuſſion, except what good manners and politeneſs impoſed.

The teachers were choſen from among men of the firſt talents, known either by their diſcoveries or writings. On the firſt and ſixth day of each decade, Lagrange and Laplace taught mathematics, Hauy phyſic, and Monge geometry. On the ſecond and ſeventh days, Daubenton lectured

on natural hiſtory, Berthollet on chemiſtry, and Thouin on agriculture. On the third and eight days, Buache and Montelle read geography; hiſtory as written by Volney, and the morality of Bernard Saint Pierre. The fourth and ninth days in each decade, were devoted to the principles of univerſal grammar by Sicard, logic by Garat, and general literature by Laharpe.

The journal, which I have now before me, the National Convention ordered to be publiſhed. It conſiſts of two grand diviſions, lectures and debates, or conferences. Six octavo volumes of the lectures have already appeared (*Seances des Ecoles Normales, recueillies par ſtenographe, et revues par le profeſſeur. Leçons, tom. I—VI. à Paris, l'an* 3.) Theſe ſix volumes contain ſixty-one colfections and lectures of the profeſſors juſt mentioned, in the head claſſes, from the 20th of January to the 15th of May, 1795. In truth, whatever fell from the lips, or flowed from the pens of ſuch enlightened men as Lagrange, Laplau, Hauy, Monge, Dauben-

Daubenton, Berthollet, Thouin, Buache, Volney, Sicard, and Laharpe, had a claim on the public attention; but they did not extend beyond the firſt principles of the ſciences, which was as much as could be expected in four months, or twenty-four lectures of an hour each. In my opinion, Hauy has been very ſucceſsful in his phyſical lectures. There is only one volume of the debates or conferences publiſhed (*Seances des Ecoles Normales. Debats, tom. I. à Paris, l'an* 3.) it contains twenty-five collections; but it ſeems far from being intereſting (perhaps it could not be otherwiſe,) and it was very judiciouſly compreſſed into one volume.

The object which the Convention had in view, in erecting the Normal Schools, was to introduce and explain the *methodiſtic* mode of inſtruction, as it is now called by ſome. On re-peruſing the 6th volume of the works of the Normal Schools, I found nothing to complain of. It muſt ſtrike the reader, however, that the Normal Schools

can have produced nothing remarkable. They were raiſed upon a haſty and unſtable foundation, and hence, in leſs than a year, they were diſſolved.

The ſchools, which exiſt at preſent, are the Central Schools, the Polytechnic School, and the Schools for the Public Service (*Ecoles de Service Publique.*)

The law for the central ſchool was enacted on the 3d Brumaire, fourth year of the Republic. The regulations are as follow: There ſhall be a central ſchool in each department. The whole of the inſtructions ſhall be divided into three parts or ſections; drawing, natural hiſtory, the ancient and modern languages, ſhall be taught in the firſt; mathematics, phyſics, and chemiſtry, in the ſecond; and univerſal grammar, the fine arts, hiſtory, and legiſlation in the third. The pupils to be received into the firſt at the age of twelve, into the ſecond at fourteen, and into the third at ſixteen. There ſhall be a public library in each central ſchool, with a botanic

tanic garden, and apparatus of chymical and philoſophical inſtruments. The profeſſors to be examined and choſen by a Jury of Inſtruction (*Jury d'Inſtruction*) and the choice to be confirmed by the departmental adminiſtration. A profeſſor cannot be diſmiſſed by the aforeſaid adminiſtration, unleſs there be a complaint preferred againſt him by the Jury of Inſtruction, which muſt be well grounded; as he is at liberty to defend himſelf, and there is a final appeal to the Directory. The ſalary of the profeſſor is from 2400 to 3600 franks alſo to be paid by the departmental adminiſtration. They have beſides, ſuch a yearly gratuity from each pupil, as the department thinks fit, which ſeldom exceeds twenty-five franks. The fourth part of the pupils are in general too poor to ſpare any thing.

It is eaſy to remark, that the general rules or laws are very well digeſted; but the manner in which they are to be obeyed or maintained, ſhould have been laid down at the ſame time. It is to be lamented alſo,

that morality is paſſed over; eſpecially as the public exerciſe of religion is aboliſhed. In the ſecond ſection, the learner from fourteen to ſixteen, is inſtructed in the abſtract ſciences, which tend very much to ſharpen the underſtanding, and to call forth the latent powers of the mind; and from ſixteen to eighteen, he is taught to read the beſt hiſtorians, a ſtudy peculiarly improving to the minds of youth at that period.

From the Central Schools I ſhall now proceed to that of the Four Nations (*Ecole centrale des Quatre Nations, établie dans le ci-devant College des Quatre Nations*). I ſhall give you an account of the teachers and the hours of lecture.

FIRST SECTION.

Lectures every day, except the 5th and 10th days in the decade.

Ancient Languages.

Gueroult, the elder, reads from nine to half paſt ten in the forenoon.

Natural

Natural Hiſtory.

Brongnard the younger, from half paſt ten till twelve at noon. He is a lively young man, has a pleaſing delivery, and I have liſtened to him with a great deal of pleaſure.

All the pupils in this claſs have the afternoon to themſelves; and it is entirely at their own option, to repeat or not, what they heard in the forenoon.

Drawing.

Moreau, the younger, teaches drawing from twelve till half paſt one.

SECOND SECTION.

Mathematics.

Lacroix teaches arithmetic, algebra, geometry and trigonometry, from nine to eleven in the forenoon, on all the complementary days, which are one, three, ſeven, nine. Lacroix has a fine delivery, and is a very good mathematician, as is well

known by the following performances: *Traité élémentaire de Trigonométrie rectiligne et ſpherique, et d'application de l'algébre à la Géométrie, Paris, an* 7, 8. *Elémens de Géométrie deſcriptive, Paris,* 1795. *Traité du Calcul différentiel et intégral,* 2 *tom.* 4*to. Paris, an* 7; and he has in the preſs, *Traité des différences et des ſeries.*

Experimental Philoſophy and Chemiſtry.

Briſſon reads all the non-complementary days, from half paſt ten to eleven. He is an impreſſive reader, and all his reaſonings are well grounded. He is known by a work on the ſpecific gravity of bodies. He has beſides, written three volumes on phyſics, two of which are already publiſhed, and the third is impatiently looked for. I do not heſitate to ſay, that this work contains the beſt ſyſtem of phyſics in the French language. In this ſection there are only two hours each day ſet apart for reading lectures; ſo that the pupils have time enough to learn mathematics and phyſics in the

ſecond

ſecond year, if they chuſe to occupy their time in ſuch ſtudies.

THIRD SECTION.

General Grammar and Logic.

Domergue reads all the complementary days, from nine to eleven.

Hiſtory.

Montille, all the even days, from nine to eleven.

Legiſlation.

Grivel, all the non-complementary days, from nine to eleven.

Fine Arts.

Fontanes, all the non-complementary days, from eleven to one.

This ſchool has beſides an agent and ſecretary, C. Lepine.

This ſchool has a handſome library, which formerly belonged to the *College des Quatres Nations*; a collection of philoſophical inſtruments, which are rather old, but kept

kept in good order by Briſſon, on which he makes experiments very ſucceſsfully. There is likewiſe a ſmall botanic garden annexed to it. This ſchool, when a college, was mouldering faſt into ruins; but it is now undergoing a thorough repair, and, when finiſhed, will be found to be very neat and convenient.

The ſecond central ſchool in Paris is in the Pantheon, formerly the church of Saint Geneviévés. The regulations are entirely the ſame. Among the teachers in natural hiſtory are Cuvier, and Deparcieux, who is ſtill better known. The third central ſchool is in the ſuburb of Saint Anthony, in the former Jeſuits' College. Among the teachers in thoſe ſeminaries ſome are known by their literary productions, and thoſe who are not, may yet be very well qualified to fill their reſpective ſituations. Theſe two ſeminaries have good libraries, a collection of at leaſt the moſt

uſeful

uſeful philoſophical inſtruments, and each a ſmall botanic garden.

In thoſe departments where univerſities, colleges, large cloiſters, palaces of emigrants, and libraries were already eſtabliſhed, it was eaſy to organize central ſchools; but where ſuch univerſities, &c. were wanting, they are not even at this day furniſhed with central ſchools. I ſhall now give you a liſt of thoſe ſeminaries, and the places in which they are eſtabliſhed. Thoſe marked with an aſteriſm are not yet organized, or at leaſt their organization has not been publicly announced.

Departement de l'aiſne	-	in Soiſſons.
Dep. d'Allier	-	Moulins.
Dep. des hautes Alpes .	-	Gap.*
Dep. de l'Ardeche . .	-	Tournon.*
Dep. de l'Arriége . . .	-	St. Girons.
Dep. de l'Aude	-	Carcaſſonne.
Dep. des Bouches du Rhone	-	Aix.*
Dep. du Cantal	-	St. Flour.

Depart-

Departement de la Charente inférieure . . in Saintes.*
Dep. de la Correze . . - Tulle.
Dep. de Côtés du Nord - Guincamp.*
Dep. de la Dordogne . - Périgueux.
Dep. de l'ain . . . . - Bourg.
Dep. des baſſes Alpes . - Digne.*
Dep. des Alpes maritimes - Nice*.
Dep. des Ardennes . . - Charleville.
Dep. de l'Aube . . . - Troyes.
Dep. de l'Aveyron . . - Rhodez.
Dep. de Calvados . . - Caen.
Dep. de la Charente . - Angoulême.*
Dep. du Cher . . . - Bourges.
Dep. de la Côté d'or . - Diyon.
Dep. de la Creuſe . . - Aubuſſon.*
Dep. du Doubs . . . - Beſançon.
Dep. de la Drome . . - Montelimart.
Dep. d'Eſcaut . . . - Gand.*
Dep. de L'eure et Loire - Chartees.
Dep. de la haute Garonne - Touloufe.
Dep. du Gers . . . - Auch.
Dep. du Golo . . . - *
Dep. de Lille et Vilaie . - Rennes.

Dep.

Department de l'Indre et Loire . . . . . in Tours.
Dep. de Jura . . . - Dole.*
Dep. de Liaſmone . . - *
Dep. de Finiſtere . . - Quimpes.*
Dep. de haute Loire . - Puy.
Dep. du Loiret . . . - Orleans.
Dep. de la Lozere . . - Mende.
Dep. de la Manche . . - Avranches.
Dep. de la haute Marne - Chaumont.
Dep. de Lot et Garonne - Agen.*
Dep. de la Mayenne. . - Laval.*
Dep. de la Meuſe inférieure . . . . . - Maeſtrict.*
Dep. du Mont blanc . - Chamberry.
Dep. de Morbitian . . - Vanner.
Dep. de deux Nethes . - Anvers.
Dep. du Nord . . . - Lille.*
Dep. de l'Orne . . . - Seez.*
Dep. du Pas de Calais . - Arras.*
Dep. de baſſes Pyrenées - Pau.
Dep. des Pyrennées orientales . . . . . - Perpignan.
Dep. de haut Rhin . . - Colmar.

Depart-

Departement de Dyle . in Bruxelles.
Dep. de l'Eure . . . - Evreux.
Dep. de Gard . . . - Nimes.
Dep. de Gemmape . . - Mons.*
Dep. de la Gironde . . - Bourdeaux.
Dep. de l'Herault . . - Montpellier.
Dep. de l'Indre . . . - Chateauroux.
Dep. de l'Iſere . . . - Grenoble.
Dep. des Landes . . - Saint Sever.
Dep. de la Loire . . - Rouanne.
Dep. des Forets . . . - Luxembourg*
Dep. de la Loire inférieure - Nantes.
Dep. du Lot . . . . - Cáhors.
Dep. de Maine et Loire - Angers.
Dep. de la Marne . . - Chalons.
Dep. de la Meuſe . . - Verdun.
Dep. de la Lys . . . - Bruges.*
Dep. de la Meurthe . - Nancy.*
Dep. de Loire et Cher . - Vendome.
Dep. du Mont terrible - Porentruy.
Dep. de la Moſelle . . - Metz.*
Dep. de la Nieve . . - Nevers.
Dep. de l'Oiſe . . . - Bauvais.*
Dep. de l'Aurthe . . - Liege.*

Depart-

Departement du Puy de Dorne . . . . . in Clermont.
Dep. des Pyrennées . - Tarbes.
Dep. de bas Rhin . . - Straſbourg.
Dep. du Rhôn . . . - Lyon.*
Dep. de Sambre et Meuſe - Namur.*
Dep. de Seine et Loire - Autun.
Dep. de la Seine et Marne - Melun.
Dep. de la Seine inférieure - Rouen.
Dep. de la Somme . . - Amiens.
Dep. du Vas . . . . - Toulon.
Dep. de la Vendée . . - Luçon.*
Dep. de la haute Vienne - Limoges.*
Dep. de l'Yonne . . - Auxerres.*
Dep. de la haute Saone - Veſoul.*
Dep. de la Sarthe . . - Mans.*
Dep. Seine et Oiſe . . - Verſailles.
Dep. de deux Sevres . - Niort.*
Dep. du Tarn . . . - Alby.*
Dep. de Vaucluſe . . - Carpentras.
Dep. la Vienne . . . - Poitiers.
Dep. de Voſges . . . - Epinal.*

Beſides the three central ſchools in Paris, ninety

ninety ſeven are intended for the departments, of which fifty-one are organized, and forty are yet unorganized. Different teachers are ſtill wanting in ſome of the organized ſchools; for example, at St. Giron's, in mathematics and phyſics. In Tulli, all the teachers are wanting, except thoſe of drawing and grammar. In Montelimart, there are only two, one in natural hiſtory, and the other in mathematics. In Chateauroux, there are none in phyſics, or in the whole third ſection. In Puy, there are none at all in the firſt claſs. In Porentruy, Anvers, Nevers, Pau, Autun, phyſics and chemiſtry are quite neglected, for want of profeſſors. Collections of inſtruments and libraries are wanting in many. There are no teachers of the foreign languages to be found in any. Lalande, ſince his journey to Gotha, laſt ſummer, confeſſes that the knowledge of German literature would amply repay the trouble of acquiring the language of that country, even to be able to read the books which appear in it. He has

has written to the Miniſter of the Interior on that ſubject, and entreated that perſons ſkilled in the German language, may be appointed to teach it in the central ſchools. Yet we do not obſerve the leaſt inclination to learn the foreign languages. In the narrow circle of my acquaintance, however, I know ſome who ſpeak German with fluency. Among this number are Mr. Bourgoing, well known by his juſtly admired writings on Spain; Cuvier, Member of the National Inſtitute, and profeſſor of natural hiſtory; Coquebert, profeſſor of hiſtory, and a member of the general department of weights and meaſures, a young man of very genteel addreſs, and good education. He recommended the introduction of many foreign articles of utility; but, in purſuance of the Miniſter's advice, he went to Italy, where he exchanged his pen for a ſword, and is now a good ſoldier.

I have already remarked, that morality and geography are not ordered to be taught in the central ſchools. One teacher

is

is only appointed for Latin and Greek, to which he devotes two hours each day, the age of the pupils being from twelve to fourteen. But in so short a time, pupils of that age cannot be expected to make any great progress in the acquisition of those languages. I have heard many of the best philologists in Paris complain, that ancient literature is very little attended to, not to say quite neglected. In some countries, it is prized beyond its value, and in others, it is depressed beneath it. In my opinion, the lovers of science ought to know at least as much Latin and Greek, as will enable them to trace the roots of those scientific words, for which we are indebted to those languages. Lectures are read in the central schools; but no books are prescribed to the pupils, nor are they called on to repeat what they have heard. I am not quite certain that a youth, from the age of fourteen to sixteen, can be well grounded in the principles of science, by this mode of instruction. I have been present at the public examinations,

tions, and found that moſt of them knew ſome things in a general way; but that very few were maſters of the primary principles of ſcience.

Towards the cloſe of the republican year, the Directory appointed commiſſioners to travel through the departments, in order to examine, and to make a report of the ſtate of the central ſchools. Many of thoſe were my friends and acquaintances, and they aſſured me, that in moſt places, they found thoſe ſchools in a very indifferent ſtate: even ſome of the teachers knew very little of what they profeſſed. The commiſſioners ſaw that it was very neceſſary, that proper books ſhould be written, for the uſe of theſe ſchools. They lamented, at the ſame time, that, in moſt of the departments, the central ſchools were little ſought and attended by very few.

As ſoon, however, as defects can be ſupplied, and proper regulations adopted, with the means of carrying them into execution, it is very probable that thoſe central ſchools,

ſchools, ſuch as they are, will be found to be of great utility.

The next ſchool, but of a higher order, is the Polytechnic School, in the former *Palais de Bourbon*, where the Aſſembly of Five Hundred alſo hold their ſittings in a large hall. The pupils are tranſlated from the central ſchools, after a preliminary examination, in the elements of arithmetic, algebra, geometry, trigonometry, &c. The number of the pupils is ſettled at 360, who are divided into brigades, twenty to each hall, under the inſpection of the teachers, and a viſitor, or chief inſpector, whom they alternately chooſe from among themſelves. The common courſes in theſe ſchools require three years, and the ſchool is divided into three correſponding claſſes. Deſhautschamps, the preſent director of the Polytechnic School, is a profound mathematician. He is often preſent at the lectures, and ſpares no pains to keep the pupils in proper order. The laſt year, he carried a decree that the teachers and pupils ſhould wear

wear an uniform of buff-coloured waiſt-coats, and blue frocks with yellow buttons, on which are inſcribed the words, "*Ecole Polytechnique.*" Beſides the director, there are two adminiſtrators, Le Brun and Lermina, who are very honeſt men.

Firſt Year, or firſt Claſs.

In this claſs, the higher algebra and analytic geometry are taught, together with that part of geometry which is particularly applicable to the practice of ſtone-cutting, carpenter's work, ſciagraphy, or ſhadowing, perſpective, and the conſtruction of maps. The teachers are Monge, who is now in Egypt, and his aſſiſtant Hachette. The chemiſtry of Fourcroy is alſo explained in his claſs, by Salternes. Haſenfratz lectures on general phyſics, including mechanics, and the other parts of phyſics, which are found neceſſary in mechanical employments.

Second Year, or ſecond Claſs.

The arts of laying out roads, erecting bridges, building, and all that relates to

houſehold furniture, are taught by Lagarde and Dubois.

The ſcience of building, or any peculiar ſtyle of architecture is taught by Gay and Vernon.

Prony and Fourier, explain hydroſtatics, hydraulics, and mechanics.

The chemiſtry of the organic, vegetable, and animal ſubſtances, are taught by Berthollet and Chauffier. The former is at preſent in Egypt.

Third Year, or third Claſs.

Fortification is taught by two officers of the engineers.

The conſtruction of ſuch engines as relate to mechanics, are explained by Prony and Fourier.

The chemiſtry of minerals, metallurgy, and mining, are taught by Guiton de Morveau.

Lagrange beſides, reads lectures on differents parts of the mathematics, particularly the analytic. There are three drawing maſters.

The Polytechnic School is kept in very proper

proper order; it contains a good philoſophical apparatus, in three rooms on the third ſtory. In the firſt room, are three ovens or ſtoves, with glaſſes, to make expements on the nutrition of plants by gaſes, and many conveniences for the proſecution of phyſical and chemical reſearches.

In the ſecond room there is a large collection of mechanical and hydroſtatical, optical, aſtronomical, electrical, and magnetical inſtruments; moſt of which belonged to Nollet, and Sigard de la Fond; and they are kept in good order, and well arranged.

Among the few Engliſh inſtruments, I obſerved there, was an excellent air pump on Smeaton's plan, improved by Nairn. This formerly belonged to Lavoiſier; but, as it had only one tube, he exchanged it for one with two, which, though more quick, does not evacuate the ſame quantity of air in a given time. There is on the ſecond floor, a hall highly decorated, which is filled with a great number of inſtruments

and models, many of which ought to be in the firſt. A perſon is appointed to keep thoſe inſtruments in order, and to arrange the new ones. The pupils have acceſs to them when they pleaſe.

This Polytechnic School has a very neat and good library of about ten thouſand volumes, of the chief works on the different ſubjects taught in this inſtitution. It is open, for the uſe of the pupils, ſome hours every day, and on the decades the whole day. It is conſtantly conſulted by the ſtudents, of whom I have often found from twenty to thirty in it at a time.

In a room, ſet apart for that purpoſe ſolely, there are models of machines, ſome of which are very intereſting and uſeful; but others are of little value, and indifferently executed. It may be only called the beginning of a collection of that kind, which will be ſupplied by degrees, with models of machines of more importance, and better workmanſhip.

All theſe models, machines, and philoſophical

phical inſtruments, may be ſaid to have coſt nothing, having been partly taken from the former public collections, and partly from the royal philoſophical and mechanical cabinets, or from thoſe of the emigrants.

Three rooms are ſet apart for architecture alone. In the firſt, was ſtereotomy, which, in the ſcientific language of the Polytechnic School, ſignifies that part of ſtone-cutting, on which Frezier and De la Rue have written ſo much. The theory and rules of projection are firſt ſtudied; as when a ſolid body, of a given figure, is to be cut, according to plans or ſchemes of a given poſition, ſuch as a cylinder to be cut by another cylinder, or by two cylinders; or when a body, of which one end is a circle, and the other an ellipſis, is to be cut by a given plane, there to define the curve lines of the projection; or, on a kind of cone, the baſis of which is an ellipſis, to define the ſection, which will be a circle.

Theſe, and many other ſuch problems, are executed from models remarkably good.

This ſtereotomy, together with deſcriptive geometry, are cultivated with a great deal of zeal and induſtry.* I will not ſay that the pupils ſhould be ignorant of theſe

* In the ſame ſchool, deſcriptive geometry is taught, as well as the art of repreſenting on paper, objects which have three dimenſions by two.

It were to be wiſhed that the learned author had employed the art he here mentions, in explaining the above ſections of ſolids, which, at the beſt, are not very eaſy of digeſtion. It ſeems ſcarcely fair in him to expect ordinary, or, I may venture to ſay, even mathematical readers, to underſtand from mere words, a ſubject in which we ſee the French geometricians very properly employ both figures and models, to aſſiſt the imagination. Cæſar's, merely verbal, deſcription of his bridge over the Danube, is ſcarcely intelligible. But when a man ſees a figure, and ſtill more a model of it, he is ready to deſpiſe himſelf for not having underſtood ſo very ſimple a ſtructure, by a ſingle hint. In my opinion, the ſolid ſections mentioned in the text, are far more difficult to be apprehended, without ſuch aſſiſtance, than Cæſar's bridge. But I have tranſlated the paſſage literally, and muſt leave the reader to make the beſt he can of it, as I have done.—*Tranſlator.*

things,

things, nor will I deny that the knowledge of them may be found uſeful in many reſpects, particularly in the conſtruction of charts and maps, deſigns in architecture, and mechanics, &c.; but I think I may venture to aſſert that they coſt more time and application than they deſerve.

The ſecond architectural room was entirely appropriated to ſtone-cutting, or the determinative formation of certain figures. They make uſe of a compoſition of ſtone to form models of portals, gates, bridges, &c. which the pupils muſt work themſelves. Moſt of thoſe models were very neat, and on the whole well executed. Their height was from eight to ſixteen inches.

The third room contained models of all the orders of architecture; and of entire façades, buildings, palaces, and temples. There is a perſon in the ſchool, who models with great exactneſs and elegance.

The drawing or deſigning ſchool is a fine long ſaloon, to which the light enters from above. It is divided into three claſſes.

The firſt is confined to the drawing of heads, hands, feet, &c.; in the ſecond, whole figures are drawn after deſigns; and in the laſt from the life, and from fine models in gypſum, of which the ſchool has a remarkably good collection. Some very fine deſigns of the pupils are hung up in both.

The Polytechnic School has two very large and fine chemical laboratories, beſides two of inferior extent, and ſome mechanical workſhops. The director and adminiſtrator have lodgings, at free coſt, in the ſchool.

As a ſtranger, I have attended ſeveral lectures, among which was the analytic, by Lagrange. Whatever this great man ſays, deſerves the higheſt degree of conſideration; but he is too abſtract for youth. In the examination of theſe lectures, it has been found, that he has diſcovered a new demonſtration of the firſt principles of the differential calculus; and his *Solution des équations numériques, de tous les degrés, Paris*, 1797, merits attention.

I have

I have heard Prony's hydraulic lectures, particularly on the motion of fluids through pipes, and on the undulation of water. This extraordinary man has the moſt impreſſive and captivating delivery, which can poſſibly be conceived. In the courſe of the laſt year, he printed a text book of his lectures, containing theorems and problems, relating to his ſubjects, and a ſketch or ſkeleton of the lectures themſelves. In the 7th year, Prony began a courſe, in which he propoſed to demonſtrate hydraulic theories in general. I have heard ſome of thoſe lectures, which were excellent; but I fear that few of his hearers (about twenty in all) will be able to keep pace with him.

I have heard Fourcroy read on the fermentation of wines, and on the nature, quality, and preparation of alcohol. He made different experiments, to ſhew that the flame of burning alcohol contains a variety of colours, ſuch as purple, violet, and green; the laſt of which appeared on

mixing with it a ſolution of vitriol of copper. Fourcroy's delivery is fine, orderly, and emphatic; but perhaps a little too rapid, for ſome youths beginning the ſtudy. When he had finiſhed, he proceeded, in purſuance of a certain order, to examine from eight to ſixteen pupils.

I have heard Haſenfratz lecture on electricity, lightning and thunder. He concluded with an hiſtorical detail of all the ſyſtems of electricity; but paſſed over Symmer's theory, or the dualiſtic ſyſtem entirely. He adopted the theory of Epinus, which was become prevalent in Paris. Hauy has ſince attacked the ſyſtem of Epinus, relative to electricity and magnetiſm. He denies that the peals or claps of thunder proceed from the electric ſpark, which flies from one cloud to another, and burſts or ſtrikes through the interjacent air, and inſiſts that it comes from a vacuum, produced by the condenſation of exhalations, which are converted into rain: if ſo, there never would be any peals or claps of thunder, which

which would not be accompanied with rain. I have alſo heard Haſenfratz lecture on machines.

The object of thoſe lectures ought to be whatever relates to machinery, practical mechanics, and the different modes by which the motions of the machines can be made to produce the different effects, ſo as to attain the object. I have not heard enough of thoſe lectures to enable me to ſay, how far this object may be attained. Haſenfratz is deficient in delivery. Once in each decade, he conducts his pupils to ſee the machines, the management of the manufactures, the rooms where the arts are carried on, and where mechanics work. I accompanied him, in one of his mechanical excurſions, which are exceedingly uſeful, and furniſh the pupils with ideas, which they could not obtain in lecture-halls or libraries.

It was peculiarly enacted, that each of the pupils ſhould have 1200 livres a year, but this was decreed in the times of the

assignats: so that those 1200 livres in paper yielded very little money, and notwithstanding the assignats are called in, the pupils received little more than 200 livres a year, which amounted in the whole to 72,000 livres a year annually. The Minister of the Interior, in the seventh year, desired the sum of 394,133 franks, for the use of the Polytechnic School; and certainly the pains and expence of the Government are well bestowed on an institution, which will furnish the state with so many public servants, and useful subjects.

When the lectures are closed, which happened this year in Brumaire, there is an examination of all the pupils who have finished their course, and who would wish to enter into the schools destined for the accomplishment of candidates for the public service, in the construction of roads and bridges, ship-building, &c. or of those who would wish to become masters in other useful arts. For the present examination, the Directory appointed Laplace and Bossut.

ſut. The firſt examined the ſtudents in the analytic ſciences, and the other in mechanics. Thoſe who were to be examined were called up in order, and were obliged to demonſtrate without book the propoſed theorems, and to ſolve the problems on a black table; which was conſidered at once as a proof of talents and readineſs. Laplace propoſed queſtions in ſeries, logarithms, and curve lines, in that part of algebra which is applicable to geometry and trigonometry, and in the differential and integral calculi. He propoſed every queſtion with much perſpicuity and preciſion, and gently recalled the pupil to the right point, if he happened to wander from it.

Boſſut, in another room, examined in mechanics, ſtatics, hydroſtatics, hydraulics, &c. I found moſt of the pupils anſwer very well, and with great readineſs, difficult problems of the higher mathematics. But it muſt not be expected, that amongſt ſo many, ſome would not be found of moderate and ſome of indifferent talents.

Deſhauts-

Deſhautschamps, the director, told me, that Laplace, on the whole, was not well ſatisfied, and that ſome of the pupils were not entitled to that atteſtation, by which alone they could be admitted into the Schools for the Public Service. He lamented, and not without reaſon, that in thoſe examinations, the young men were left without any occaſional aſſiſtance to their memory or conception, eſpecially when they found themſelves bewildered in algebraic calculations. It is certain, that a wink would often ſet them right, provided they had underſtanding and knowledge enough to avail themſelves of it, which in itſelf would be a proof that they had not mis-ſpent their time. I informed Deshautschamps, that with us public examinations were held in gunnery, navigation, land-ſurveying, &c.; that part of theſe examinations was by word of mouth, and part in writing, that all the abſtruſe theorems and problems were propoſed in writing, to which the candidate was required

to

to give written anſwers, and that this method allowed him time to reflect on the ſubject, to arrange it in his mind, and to reviſe and correct his piece as often as he pleaſed. Deſhautschamps highly approved of this mode, and ſaid he would ſpare no pains to have it introduced. Theſe examinations were public, though I very ſeldom found that foreigners, and thoſe who were not in ſome meaſure connected with the Polytechnic School, were preſent.

LETTER

LETTER VI.

SCHOOLS FOR PUBLIC SERVICES, VIZ. FOR THE CONSTRUCTION OF ROADS AND BRIDGES, FOR MINERALOGY, GEOGRAPHY, SHIP-BUILDING, ARTILLERY, FORTIFICATION, NAVIGATION, &c.

School-house formerly a Palace—Collection of Models—Library—Course of Study and Salary of the Students—Mineralogical School and Collection—Professors—Laboratory—Learned Ladies, not always pretty and neat—Gravimeter, not equal to a good hydrostatic Balance—Instrument for measuring the Angles of Crystals—Instrument for ascertaining small Degrees of Magnetism and Electricity—Geographical School—School for Naval Architecture—Marine Depository—Artillery Schools—Fortification School—Marine Schools.

IN the preceding letter, I have given an account of the Central Schools, and of the excellent management of those called the

the Polytechnic. When any one has punctually attended the Polytechnic ſchools for a term not leſs than one year, and undergone an examination, he is then admitted to ſome of the "Schools for Public Services;" or, as they are ſometimes called, "Schools of Application." The pupils, ſoon after their appointment, obtain a ſmall emolument, and afterwards paſs from thence to the ſervice of the ſtate, when an opportunity occurs. Theſe Schools of Application are for *the conſtruction of roads and bridges, for mineralogy, geography, ſhipbuilding, artillery, fortification, and nautical affairs.*

The School for conſtructing Roads and Bridges, is ſituated in the *Rue Grenelle*, and was formerly a palace of the Duke de la Chatel. It is diſpoſed and embelliſhed with conſummate taſte and magnificence; and contains a number of excellent apartments: the ſtyle, indeed, of the building, eſpecially of the two ſaloons in front, is not very conſiſtent with the modeſty of a public ſchool, but

but this congruity would be dearly purchaſed, by reducing the grandeur of the edifice to a level with its preſent uſe. Frudaine was, in the time of monarchy, the firſt founder of this ſchool. Peronnet, author of an excellent work, entitled "*Deſcription des Projets et de la Conſtruction des Ponts*,* has ſince greatly contributed to its improvement. The buſts of both thoſe able men, the firſt of bronzed plaſter, and the other of marble, are ſet up in the ſchool-room.

Two of the apartments are appropriated to the muſeum, in which are not only draughts, but alſo models of buildings and machines, which relate in any reſpect, to the conſtruction of roads and bridges, ſuch as all ſorts of rammers for driving vertical and inclined piles, five different models for

* The firſt edition of this work conſiſted of two volumes in folio; the ſecond and improved edition is in quarto, and the improvements have been printed in folio, for the accommodation of ſuch as were in poſſeſſion of the firſt edition.

ſawing

ſawing piles under water, in imitation of an Engliſh machine, which is very ſimple, cheap, and certain in its effects; various models of machines for raiſing water, of forcing pumps, and of ſluices for canals; alſo models of the moſt remarkable bridges on the large rivers of Europe, of bridges formerly built in France, chiefly by Peronnet, and of the *Pont Neuf* at Paris, which is built very flat, and is uncommonly ſtrong; models of the bridges at Neuilly, Nantes, Orleans, Branoi, Nonnettes, Bicherot, &c. together with draughts and models of every thing that relates to nautical architecture, ſome of the moſt remarkable of which are the caiſſons at Cherburgh. Theſe have not fulfilled the public expectation; becauſe, as Prony ſuppoſes, they have been badly executed. Though, however, the baſons are ſmall, and completely filled, yet the anchorage within the cones is tolerably ſecure. All theſe models of the ſchool for the conſtructing of roads an d bridges are neat, accurate, and excellent: they are placed in the moſt beautitul order,

and

and there is in no country whatever, a finer and more complete collection.

The ſchool has a fine library of about two thouſand five hundred volumes of good mathematical treatiſes, chiefly relating to hydroſtatics, hydraulics, water-works, roads, and bridges. In the four rooms for inſtruction, the ſtudents are taught the elements of phyſics and mathematics; and to draw plans and ſketches of roads, bridges, canals, harbours, and all kinds of buildings connected with them. They alſo learn to ſuperintend the actual conſtruction of buildings, to manage the expences, and take an account of the annual rents. The number of ſtudents was fifty, thirty ſix of whom had a penſion of ſeventy franks per month, or eight hundred and forty franks per annum. Their courſe of ſtudy is uſually completed in two years; before they quit the ſchool, and frequently whilſt they reſide there, they undergo examinations, and are obliged to reſolve problems and queſtions, relative to the practical part of their

their profeſſion. Prony ſhewed me ſome of theſe queſtions; moſt of which were difficult, and related to roads, bridges, ſluices, &c. The ſolutions were accompanied by excellent drawings of plans and ſections, and with exact calculations and circumſtantial accounts of the expences attending them. The preſent managers are the directors Chezy and Prony, and the ininſpector Le Sage, who exert themſelves to the utmoſt, in preſerving every thing in a ſtate of order and activity.

The Mineralogical School, No. 293, Univerſity-ſtreet, has a large and rich collection of minerals diſpoſed in glazed caſes. The collection occupies ſix different apartments, and is divided into the three following claſſes: 1. The docimaſtic collection. 2. A geographic collection of French minerals. 3. An oryctognoſtic or ſyſtematic collection, illuſtrated by models in wood of the principal varieties of cryſtallization, after the ſyſtem and diſcoveries of Hauy. The geognoſtic collection is included in the

the three former. There are alſo depoſited here collections of draughts and models of mines, and of tools, inſtruments, and machines for the uſe of miners. The appointed number of ſtudents is twenty. Hauy is keeper of the cabinet of minerals, and Vauquelin ſuperintends the chemical department. Clouet is librarian and teacher of the German language.

The lectures for the 7th year, or winter of 98-99 are the following:

Baillet, inſpector of the ſchools, lectures every firſt and ſixth day of the decade, on the art of mining.

Haſenfratz, inſpector, lectures every ſecond and eighth day on mineralogy and metallurgy.

Vauquelin, inſpector, lectures every third and ſeventh day on docimacy.

Brongniart, the younger, lectures every ſecond and eighth day on mineralogy.

Cloruet teaches drawing, Clouet the German language, and Lefroy deſcriptive geometry.

The

The celebrated and learned *Dolomieu* is both inſpector and lecturer of the mineral ſchool; but he and two of the beſt ſtudents are in Egypt. The lecturers deliver their inſtructions in winter only: the ſummer being generally ſpent in making experiments at the laboratory, or in making tours to the various mining diſtricts. This ſchool has an admirable laboratory belonging to it, under the inſpection of Vauquelin; the ſame who, in conjunction with Fourcroy, has made ſo many noble diſcoveries in modern chemiſtry. Vauquelin was not preſent, the firſt time I was there; but two ſiſters of Fourcroy, who live at Vauquelin's, were ſo good as to ſhew me this beautiful laboratory. They ſeemed to be well informed of every thing there, and told me, that they often aſſiſted their brother and Vauquelin in chemical operations; but the old ſaying, that *learned females are not always the handſomeſt and neateſt*, was verified in the perſons of both thoſe chemical ladies.

The chearful, kind, and obliging, Hauy reſides

reſides at the Mineral School, as do alſo moſt of the inſpectors and lecturers. On my firſt viſit, I found him engaged in determining the ſpecific gravity of a calcedon by means of Guiton's gravimeter. This inſtrument is an improved areometer. The body, whoſe weight is to be determined, is firſt put into the upper ſcale above water, and afterwards into the lower under water, and in both circumſtances the areometer is introduced, and ſinks to a certain mark, obſerved on the glaſs or ſlip of wood affixed. If my memory do not fail me, this inſtrument is deſcribed in Gren's Phyſical Journal, and is very much like the areometer of Hauy and Nicholſon. It is made either of glaſs only, or with a thin piece of metal, affixed by the ingenious glaſs-worker Betaly. That of glaſs, by which one can determine the weight of twenty gramma, or three-fourths of an ounce, coſts thirty-ſix franks, or thirty ſhillings.

This inſtrument has ſeveral defects.

1. Small

1. Small articles cannot be weighed by it. 2. It is very difficult to determine whether the mark is above or under the exact ſurface of the water. 3. The weight can ſcarcely be determined, to any certainty, nearer than one-ſixth or one eighth part of a grain. In my opinion, the ſpecific gravity of bodies can be determined with greater accuracy, by means of a good hydroſtatic balance.

The figures of cryſtallized bodies were inveſtigated, and in ſome degree determined by Deliſle. Hauy has ſince thrown much light on the ſubject. He has contrived an inſtrument for meaſuring the angles of cryſtals, which conſiſts of two ſmall wires moveable about a fine pin. The one carries a finely graduated ſcale, or angle-meaſurer, and the other extends over the ſcale; ſo that when the angle of the cryſtal is included between thoſe two wires, the ſcale meaſures a ſpace equal to the vertical angle. There is alſo a mechanical contrivance, which fixes the limbs till

the inſtrument be taken off the body, in order to obſerve the magnitude of the angle. Hauy has diſcovered a method of determining the forms and angles, not only of particular ſalts, but alſo of ſtones, earths, and metals, and he has exhibited beautiful ſpecimens of this method, as practiſed on ſubjects in his own collection. He took a regular piece of quartz, and, from different examinations of the exact meaſurement of the ſpace it occupied, immediately derived the cryſtalline ſtructure of the body, which is two oppoſite pyramids, whoſe common baſe is a rectangle differing little from a ſquare. A man reſides in the ſchool, whoſe employment it is to cut in wood, the different forms and figures of cryſtals, under the direction of Hauy.

Thus has Hauy brought mineralogy, by the figures of its objects, and his own calculations, under the dominion of geometry. He has publiſhed a Journal of mineralogy (*Journal des Mines*) and Coquebert has edited his *Inſtructions to the Students at the*

the School; but these works have not yet reached the hands of the booksellers.

Hauy is at present engaged on an extensive and complete system of mineralogy, in which he gives the character of every mineral as depending: 1, on external appearances; 2, on the forms and figures of its crystals; and 3, on chemical analysis and synthesis. He had seen some letters and minerals from Professor Abildgaard, in the hands of Mr. Ingversen. Both the gentlemen were particularly interesting to him, and he often testified the greatest respect for the merit of our countryman. I introduced to Hauy, Dr. Engelstoft, Mr. Horneman, and Mr. Bang; and he seemed very ready to render any service in his power to this promising young man. The Danish minerals presented to him he has already analysed, and has determined not only their physical, but their geometrical, properties.

Hauy had a pair of small instruments for

aſcertaining minute degrees of magnetiſm and electricity. On a ſmall round ſtand is fixed a well turned ſteel pin, an inch in height; and on this point, or pin, is placed a moveable needle, repeatedly magnetiſed, and about two inches in length. He took different iron ores, which he arranged in a ſtraight and apparently exact line, coinciding with the required polar line, making thereby, in fact, a collection of ſeveral ſmall and weak magnets. When, for inſtance, the cryſtallized iron ore from Norway is uſed, in order to aſcertain the ſmall degree of electricity, a braſs needle is put inſtead of the magnetized one. Before the needle and in a line with it, muſt be laid a piece of roſin barely electrified, and over it a ſtick of ſealing wax. This is a negative electric; and, ſince every body which comes into a negatively electric atmoſphere, becomes poſitively electric, the needle will be poſitive. Hauy ſhewed me very clearly that different kinds of ſtones, by being heated,

heated, become electric, ſhowing the poſitive electricity by repelling the needle, and the negative by attracting it.

Before I cloſe this account of the Mineralogical School, I muſt obſerve, that this was to be only a theoretic ſchool; that a practical ſchool was to be eſtabliſhed in a mining diſtrict; and that Giromagny, in the department of the Upper Rhine, was the place fixed upon; but this ſchool has not been yet organized. The Mineralogical School at Paris has, in the mean time, been regulated and modified in ſuch a manner, that it unites the objects of a theoretic and a practical ſchool. There is annually publiſhed, by the profeſſors of this inſtitution, a very important work, entitled "*Journal des Mines.*"

The Geographical School, under the direction and management of Prony, is attended by twenty ſtudents, who are taken from among ſuch as have completed their courſe in the Polytechnic. Here they are taught every branch which relates to the

meaſurement of land, the drawing of maps, and ſuch problems as occur in trigonometry, aſtronomy, and mathematical geography. The ſtudents then proceed to a finiſhed method of planning, and to make aſtronomical obſervations, which they apply to the determination of latitudes, longitudes, and meridian lines; and to the conſtruction of geographical maps. The ſtudents undergo an examination in all theſe ſubjects, before they quit the ſchool.

The School for Naval Architecture is in the *Rue Dominique*, No. 1016. This inſtitution exiſted at Paris long before the Revolution, and the managers admitted whomſoever they pleaſed. But this cuſtom has been altered, and no one can be now admitted, who has not firſt ſtudied at the Polytechnic. The ſtudents have each 1500 francs per annum, and are taught mechanics, hydroſtatics and hydraulics, as far as they relate to naval affairs; to draw plans and ſections of ſhips of war, to give an exact account of their expence, and even to

to ſuperintend the building of them. This ſchool is obliged to admit annually, from among the private merchants, five pupils who are alſo inſtructed in naval architecture.

The ſtudents had formerly their drawings at the Louvre, where the National Inſtitute is now held, and where is ſtill to be ſeen a collection of naval models. But in lieu of this place, they have at preſent *a General Marine Depoſitory*, in *Rue Vendome*. This ſituation is a much finer ore, and the preſent depoſitory contains a more elegant and uſeful collection of naval models and drawings. Borda and Dudin are directors of this ſchool, and Laplace is the examiner, Tilts is profeſſor of mathematics, and Pomet of architecture. Deparcieux lectures on phyſics, and Fourcroy on chemiſtry, and Daubenton teaches the ſtudents drawing. I muſt confeſs that there is too much of phyſics and chemiſtry delivered here, when it is conſidered, that the ſtudents are all from twenty to twenty-four years of age,

and have attended to both ſubjects, not only in the Central School, but alſo in the Polytechnic; ſo that they muſt have neceſſarily acquired ſufficient knowledge of them, and their ſtudies might now be more advantageouſly conducted, than in attending to theſe ſciences a third time.

Artillery Schools. The great preparatory ſchool, for ſtudents in artillery, is at *Chalons ſur Marne.* The directors of the ſchool are a *chef de brigade* and a *chef de baitaillon.* There always reſide in this ſchool two captains of artillery, a lecturer on phyſics and chemiſtry, two on mathematics, two on fortification, and a drawing maſter. Laplace is the preſent examiner. Thoſe ſtudents who wiſh to enter into the artillery ſervice, are obliged to ſtudy for at leaſt two years at the Polytechnic. They then enter, after a cloſe examination, into the regiment of artillery; but muſt ſtill proſecute a neceſſary and extenſive ſtudy of drawings, fortifications, and the warlike preparations connected with the artillery ſervice,

ſervice, in the School of Application belonging to their reſpective regiments.

The following is a liſt of the Schools of Application, with the places where they are eſtabliſhed. The firſt ſchool is at La Fere, the ſecond at Beſançon, the third at Grenoble, the fourth at Mentz, the fifth at Straſbourg, the ſixth at Douai, and the ſeventh at Auxonne. In each are a teacher of the mathematics, a private teacher and a drawing maſter; and every ſchool is placed under the inſpection of a general of brigade of the artillery. There are to be two more artillery ſchools, one at Thouloufe and the other at Rennes, but they are not yet organized. The artillery ſchool at *Chalons* is to continue in its preſent ſtate till peace be concluded, when it will undergo a new regulation, and it is ſuppoſed that the preparatory ſchool will be removed to Paris.

The Fortification School, with which that of the *Miners* is united, is at Metz, and eſtabliſhed in the *ci-devant* abbey of St. Ar-

nould. The number of pupils is not to exceed twenty: they muſt be all taken from the Polytechnic, and, when examined and admitted into this ſchool, are immediately made ſecond lieutenants, and receive the pay due to that rank. Here they are taught to apply their theoretic knowledge in founding, and actually building, works of defence and fortification, in mining and countermining, in defending and beſieging places, in drawing military plans and maps, and in every art and ſcience which belongs to the buſineſs of an engineer, both in fortified places and in the field. The School at Metz is under the inſpection of a general and two *chefs de brigade*, who all three belong to the department of fortification.

The Marine Schools are eſtabliſhed at Breſt, Toulon, and Rochefort. The ſtudents are admitted into them after previous examination in arithmetic, algebra, geometry, ſtatics, and navigation. I have not been able to procure any certain account of the

the number of ſcholars, or of their plan of ſtudy. It was propoſed and ordered, that a corvette ſhould be annually equipped for different expeditions, with ſtudents on board, who ſhould be inſtructed in rigging and unrigging a veſſel, and taught by practical knowledge and experience, every thing which belongs to the duty of a mariner. But the war has in ſome meaſure obſtructed the execution of this commendable decree.

The Navigation Schools are intended for teaching mathematics and hydrography both to officers in the navy, and thoſe of merchant ſhips. By a decree of the 30th of Vendemiaire, in the fourth year, "theſe ſchools were to continue in the ſtate in which they had hitherto been," and the Marine Miniſter was directed to eſtabliſh two other ſchools, one at Morlaix and the other at Arles.

LETTER VII.

SCHOOLS FOR MEDICINE, PHARMACY, AND THE FINE ARTS—THE FRENCH COLLEGE.

Medical School—Collections of anatomical Preparations, &c.—Philosophical Apparatus—Library—Amphitheatre—Lectures—Students from one Thousand to one Thousand two Hundred—Free School for Pharmacy—Military Hospital—Lectures there—Free School for Painting—National School for Architecture—French College—Lectures there—Public Assembly of it, and Proceedings on the Occasion—Hint to Ladies to make themselves useful, by visiting and attending the Sick.

THE Medical School is very beautifully situated in *Rue des Cordeliers*. It contains—1. A great number of excellent anatomical

anatomical preparations, and imitations made of wax; 2. A valuable collection of chirurgical inſtruments; 3. A ſmall philoſophical apparatus; 4. A large library, conſiſting of works on phyſiology, chemiſtry, anatomy, ſurgery and medicine; 5. A truly magnificent lecture room, or amphitheatre; and 6. A beautiful chemical laboratory and reading room. The lecturers are two in number to each of the following diviſions: 1. Anatomy and phyſiology; 2. Medical chemiſtry and pharmacy; 3. Internal pathology; 4. External pathology; 5. Natural hiſtory and botany; 6. Medical operations; 7. Treatment of internal clinical caſes; 8. External clinical caſes; 9. Modern improvements in treating ſuch caſes; 10. Midwifery; 11. *Medicina Florenſis.* There is but one profeſſor in each of the remaining diviſions. 12. Hiſtory and deſcription of rural accidents; 13. Medical bibliography; 14. *Materia Medica* and chirurgical inſtruments.—There are beſides, a draughtſman and modeller in wax. A room

is

is now building for the library; in the place where the books now are, the anatomical preparations will be depoſited, and more convenient apartments will be appointed for the chirurgical and philoſophical inſtruments, and for the objects of the *Materia Medica*. This ſchool is carried on with great induſtry, and the number of ſtudents amount to from one thouſand to one thouſand two hundred.

The body of apothecaries of Paris, in the year 1777, were formed into a regular college. They have a laboratory and a botanic garden in the *Rue de l'Arbalêtre*, where lectures are publicly delivered on chemiſtry, pharmacy, botany, and natural hiſtory; and at the annual cloſe of thoſe lectures, premiums are beſtowed on the moſt able and diligent ſtudents. In the fourth year of the Republic, the college formed itſelf into a free ſociety, for the cultivation of the ſcientific purſuits connected with their profeſſion, and admitted members from all the departments of France, and even from hoſtile countries.

countries. By a decree of the 3d Prairial, in the 5th year, the Directory, in a meſſage to the miniſter of the interior, approved and confirmed its ſyſtem of public inſtruction, and gave it the name of *The Free School of Pharmacy*. In this ſchool are two lecturers on pharmaceutic chemiſtry, together with an honorary profeſſor and an adjunct; two on pharmaceutic natural hiſtory, and the *Materia Medica*, with an adjunct; and two on botany, with an adjunct. This free Pharmaceutic School conſiſts at preſent of one hundred and twenty-three regular, and fifty two correſponding, members. A journal is publiſhed by this ſociety, under the title of "*Journal de Pharmacie.*" To the claſs of inſtitutions for ſurgery and medicine, is to be annexed *The Military Hoſpital for Inſtruction* in Rue St. Jacques, not far from the National Obſervatory. It was formerly that well known and beautiful building *Val de Grace*.

According to the Programma, or account of the inſtitutions, the following lectures were

were delivered there, in the 7th year, or from the 22d of September, 1798, to the 21ſt of September, 1799. The firſt, or winter courſe, conſiſted of, 1ſt, Anatomy, with phyſiological obſervations, by Huttier; 2dly, Internal pathology, by Chairon; 3dly, Practical medicine, and particularly clinical caſes, by Gibbert; 4thly. Practical ſurgery, by Barbier; 5thly, Natural hiſtory, with reference to the *Materia Medica* and pharmacy, by Perinet. In the ſummer half year were explained, 1ſt, Pharmaceutic chemiſtry, by Brougniart; 2dly, Obſervations on gun-ſhot wounds, by Dufouart; 3dly, The diſeaſes and ſetting of the bones, by Huttier; 4thly, Botany, by Barbier, who takes botanic excurſions with the pupils.

Clinical lectures are read by all the ſix profeſſors in medicine and ſurgery, with medical conferences and preſcriptions in the morning; and, in the afternoon, conſultations are held, on clinical diſeaſes, in the amphitheatre.

In the laſt decade of Thermidor, or about

about the middle of Auguſt, a general examination of the ſtudents take place, in order to confer premiums on ſuch as have diſtinguiſhed themſelves by aſſiduity in the ſervice of the hoſpital, or by attending the lectures and acquiring knowledge.

The Free School for Painting is in *Rue des Cordeliers*. This patriotic inſtitution was eſtabliſhed thirty years ago, and was at firſt a private foundation for inſtructing in the principles of drawing, one thouſand five hundred children, intended for artiſts or profeſſors, but it is now rendered quite general. Every firſt, fourth, and ſeventh day, of the decade, the ſtudents are taught arithmetic, practical geometry, ſtatuary, perſpective and architecture; every ſecond, fifth, and eighth day, they paint men and animals; and every third, ſixth, and ninth day, they draw flowers and ornaments. Of this ſchool there are two directors, who manage its concerns, a caſhier and five lecturers.

The

The National School for Architecture is at the Louvre, or National Palace for Arts and Sciences, and conſiſts of a profeſſor of geometry, who, at the ſame time, ſhows the application of that ſcience to architecture, and of a profeſſor, whoſe buſineſs it is to teach architecture in particular, with its ſubſidiary arts.

The French College is ſituated in the *Place de Cambray,* cloſe to *Rue St. Jacques,* and is a very ancient inſtitution. Lewis the Twelfth, and Lewis the Thirteenth enlarged it, and either repaired or new built moſt of the preſent edifice. This college is the only inſtitution of the kind which has not undergone ſome change during the revolution. To give you an accurate idea of what is taught here, I ſhall ſubjoin a liſt of the lecturers for this year, 1799, in the order communicated to me by Lalande.

Jerome de Lalande is inſpector of the College and profeſſor of aſtronomy. All the parts of aſtronomy, with their uſe in navigation,

gation, are explained by that diſtinguiſhed maſter, or in his abſence, by Francis de Lalande.

Manduit, profeſſor of geometry, lectures on that ſcience, and on trigonometry and algebra.

Couſin, profeſſor of theoretic phyſics, lectures on the *Analyſis Infinitorum*, with its applications, particularly to mechanics.

Lefevre Gineau, profeſſor of experimental philoſophy, gives a complete courſe on that ſubject.

Boerchart, profeſſor of medicine, explains Stoll's aphoriſms on fevers and feveriſh diſeaſes.

Portal, profeſſor of anatomy, lectures on the cauſes and ſeat of diſeaſes.

Darcet, profeſſor of chemiſtry, explains the chemical analyſis of different ſubſtances.

Daubenton, profeſſor of natural hiſtory, diſcourſes on that ſcience, at the muſeum in the botanic garden.

Bouchard,

Bouchard, profeſſor of natural and popular laws, expounds political rights.

Leveſque, profeſſor of hiſtory and morality, delivers a courſe of lectures on the hiſtory of Greece, political, literary, and philoſophical.

Riviere, profeſſor of the Hebrew and Syriac languages, expounds the text of the fourth and fifth books of Moſes.

Cauſſin, profeſſor of the Arabic, teaches his pupils to read and write that language, and to tranſlate Lockman's fables, and a part of Bilpai's moral and political work.

Perille, profeſſor of Turkiſh and Perſian, or in his abſence *Sylveſtre Lacy*, explains the firſt principles of the Perſian language, Hafez Oder, and the Expedition of Diamis Behariſtan.

Boſquillon, profeſſor of Greek, delivers philological commentaries on the Prognoſticon of Hippocrates; and *Gail*, profeſſor of the ſame language, expounds the *Corona* of Demoſthenes.

Dupuis,

Dupuis, profeſſor of Latin eloquence, and in his abſence, *Gueroult*, interprets *Tacitus De Oratoribus*.

Deliſle, profeſſor of poetry, or in his abſence, *Selis*, explains the principles of poetry in general, and of epiſtles in particular; he expounds moſt of Horace's epiſtles, and compares that poet with Boileau, Roſſeau, Voltaire and Pope.

Courand, profeſſor of French literature, treats of French literature, as compared with that of Greece and Rome, beginning with French fables. Each of the above-named profeſſors delivers four lectures in every decade.

It is evident, from the nature of this inſtitution, and of the lectures delivered, that in France the utmoſt attention is ſtill given to Grecian, Roman, and Oriental literature. But as the youths are only initiated in the languages, at the Central Schools, the profeſſors, at the French College, are under the neceſſity of beginning with the firſt principles of language, and of courſe

can

can make but a ſlow progreſs. Of theſe ſeventeen profeſſors, ſix, together with the inſpector, live in the College. In the Central Schools alſo, ſeveral of the profeſſors reſide on the ſpot.

By an invitation of Lalande, I was preſent on the 26th Brumaire (16th November), at a public aſſembly of the French College. A meeting of this kind is annually held at the commencement of the lectures. The *Auditorium* of the College is a large and elegant hall, beautifully painted. The cieling, in particular, is covered with this fine ſpecies of decoration. In the middle of the hall, is a very long table covered with cloth, about which are ſeats for the miniſter, profeſſors, and viſitors. On both ſides of the table, there are forms for other hearers; but theſe are inconvenient, and rather too far diſtant, ſo that one cannot come ſufficiently forwards. The hall was tolerably well illuminated; but ſuch a ſtrong and diſagreeable current of air paſſed through it, that the wax candles, both in the chandeliers

liers and on the table, melted away before they were half burnt, and the meeting, near its close, was almoſt in the dark.

About ſeven o'clock came *Francis de Neufchateau*, Miniſter for the Interior, attended by the profeſſors of the college, and he took his ſeat at the head of the table, on the right of the inſpector De Lalande. The miniſter appeared in his public dreſs, and was accompanied by his adjutants, officers, and other attendants. *Lalande* opened the meeting with an oration, or rather a *prælectio*, in which he briefly enumerated the lectures on different branches of ſcience, which were to be commenced. He then exhibited a few biographical ſketches of ſome of the deceaſed lecturers of this college; and proceeded to give an account of his aſtronomical labours, and of the many thouſands of teleſcopic ſtars which he had obſerved, in conjunction with his nephew, Francis Lalande. Much of his diſcourſe was taken up with ſeparate narrations, which unavoidably produced frequent and abrupt tranſitions.

tranſitions. The hiſtory of aſtronomy cannot be unknown to thoſe who read the *Connoiſſance des Temps*, much of the contents of which had already appeared in Zach's Geographical Ephemeris: as an inſtance, we may mention the account that Dr. Burchardt, who reſided a year with Lalande as a ſtudent in aſtronomy, had calculated to a day, the orbit of a comet.

C. Depuis, author of *Origine de Cultes*, recited ſome hiſtorical accounts of the Pelaſgi, in which he introduced rather violent ſallies againſt kings in general, and againſt all ſtates which were not republics, interlarding, however, his philippic with ſome ſtrong eulogia on Bonaparte, and ſeveral compliments to Francis de Neufchateau. Moſt of the gentlemen who ſpoke offered to that miniſter ſome incenſe of commendation, which indeed the worthy man perfectly merited. But, from what paſſed, one might ſee that the *captatio benevolentiæ* exiſts in republics, as well as in monarchical governments.

Boſquiloln

Boſquillon recited ſome aphoriſms of Hippocrates; but his delivery was bad, and his voice ſo indiſtinct, that I could not comprehend the whole of his meaning.

Deliſle recited part of a poem on Youth, a work on which he is at preſent engaged.

The mathematician, Couſſin, read a pleaſing eſſay on Benevolence towards the Poor and Sick. He particularly wiſhed that *the Ladies would make themſelves uſeful by viſiting the ſick, and even by attending the hoſpitals.*

Gail, profeſſor of Greek literature, recited a tract on the Spartan Republic, being part of a work which he intends to publiſh: he concluded with ſeveral tranſlations from Anacreon. Gail's genius appeared to much better advantage, in hiſtorical and proſe compoſition, than in poetry.

The whole hall was crouded with auditors, among whom was a party of ladies, who, by clapping of hands, aſſiſted in applauding the ſpeakers, and particularly Couſſin, who introduced into his diſcourſe

ſome beautiful ſketches, and admirable traits of the liberality and tenderneſs of the fair ſex.

The French College has a collection of philoſophical inſtruments, the greateſt part of which formerly belonged to the old inſtitution. This college has alſo an obſervatory; but I muſt defer the deſcription of it till another opportunity, when I ſhall give an account of the great national obſervatory, and others of leſs note, which I have viſited at Paris.

LETTER

LETTER VIII.

THE NATIONAL MUSEUM OF NATURAL HISTORY.

Library, Menagerie, &c. of this Muſeum—Its Botanic Garden—Engliſh ſaid to have ſeized Baudouin's Collection, which their Government had promiſed to protect—Gallery for Natural Hiſtory—Vaillant's frugal Preſent to the Muſeum—Diamond ſtolen from it—Collection of Quadrupeds, Zebra, Elephant, &c.—Directorial Palace—Collection of Skeletons—Library of Botany, &c.—Paintings and Drawings of Animals and Plants—Menagerie for wild and tame Animals—Lecture Room, a real Amphitheatre—Lecturers and Officers—Statues of Linnæus and Buffon—Wanton Outrages of the Mob, at the Revolution—Dead dug up—Body of Turenne, ſtill un-

decayed, ſhamefully expoſed—Cheſts ſtill unpacked, filled with Curioſities from the conquered Countries.

THE National Muſeum of Natural hiſtory was formerly called *Jardin du Roi*; but received its preſent name by a decree of the National Convention of the 10th of June, 1793. One end of it extends to the *Seine*: it conſiſts of a botanic garden, library for natural hiſtory, a menagerie, or collection of foreign animals, and an amphitheatre, or lecture-room.

The botanic garden which belongs to it is three hundred and twenty toiſes, or fathoms, long, and one hundred and ten in breadth. It is partitioned lengthways, that is, from its entrance down towards the Seine, by three very fine alleys; and interſected acroſs by various others, which terminate in the public *promenades*, or walks. The different ſquare diviſions thus formed, are uſed for plantations, and are at preſent all incloſed with rail-work. The green-houſe and

and orangerie were formerly in pretty good order, and ſeparated into rooms and ſpaces. But a new green-houſe and orangerie are now additionally erected, and they are very conveniently diſpoſed. Here is a great abundance of foreign plants and trees, and from hence all the botanic gardens of the Central Schools are ſupplied with ſeeds, and with trees, as ſoon as they can be tranſplanted. From the ſame highly cultivated ſpot, the cultivators of land can procure œconomic and nurſery trees, and even the indigent poor can obtain plants, when they can be ſpared.

Captain Baudouin, in his travels into different parts of the world, had collected a great variety of natural curioſities; and preſented the whole to the nation, on condition that he ſhould be furniſhed with a ſhip to convey them to France. The Engliſh Government conſented that this ſhip ſhould perform her voyage without moleſtation. Meanwhile the Engliſh had taken poſſeſſion of the iſland of Trinidad, where

this extenſive and famous collection had been left. When Captain Baudouin arrived at Trinidad, in order to bring away his collection, the Engliſh would not give it up, on pretence that their Government had conſented to the ſafety of the expedition by ſea, and not by land. However, this and the former expeditions were not altogether fruitleſs; for Baudouin has brought into the botanic garden about one thouſand different kinds of live plants, beſides aſſortments of ſeeds, and a conſiderable herbarium.

The gallery for natural hiſtory is a building ſituated on the right hand, as you enter the botanic garden from the ſtreet. On the ſecond floor of this building are four large apartments, where fiſhes, birds, ſhells, inſects, minerals, earths and ſtones are depoſited on ſhelves, furniſhed with glaſs fronts. The inner apartment is allotted to vegetables, and contains ſpecimens of trees, together with the herbarium of Tournefort.

Vaillant preſented to the Muſeum a part of

of his birds. But ſeveral perſons, who had certain knowledge of the fact, aſſured me, that Vaillant reſerved for himſelf the moſt ſingular and curious.

The gallery is open to the public the firſt, fourth, and ſeventh days of every decade, when it is crowded by all ſorts of people, who come there not for inſtruction, but merely to view the place, by way of amuſement. A certain number of veterans and invalids are then ſtationed in different places about the rooms, in order to ſee that the drawers are not broke open, or the curioſities in any manner injured or deſtroyed. Before this regulation took place, a diamond was ſtolen from thence, in the time of the revolution. Every ſecond, third, fifth, ſixth, eighth and ninth days of the decade, this gallery is open for ſuch only as are deſirous of ſtudying natural hiſtory.

The excellent Lacepede, who is not leſs kind and obliging than eminent for erudition, gave me a letter to Lucas, keeper of the gallery, who, with great civility, ſhewed

me every thing that was curious and remarkable in this muſeum, and particularly the collection of quadrupeds, which is never exhibited to the public. Here I had a ſecond view of ſome ſingular objects, which I had ſeen at the Hague one and twenty years before, in the Stadtholder's collection, ſuch as the ſea-horſe, zebra, elephant, orang-outang, and a variety of monkeys. There are likewiſe to be ſeen in this muſeum, a lion, a tiger, a leopard, an uncommonly large dog from the Pyrenees, and a fine ſkeleton of a camelopard, whoſe height from his forefoot to the top of his crown is ſixteen feet.

All theſe and many other quadrupeds, and ſome large birds, are exhibited to view in an apartment on the third floor, or rather on a part of the garret formed into an apartment. The remaining part of the floor has the appearance of a large hall; above are ſky-lights, and on each ſide are dens for wild beaſts.

The Directorial Palace, formerly *Palais de*

de Luxembourg, is arranged with the utmoſt conveniency and grandeur, and is now the reſidence of the Five Directors. All the window glaſs which the great manufactory at Paris had made for ſome time, was ordered for that building. But the Directory had ſo much reſpect for ſcience, as to part with whatever glaſs was wanted for the caſes of the gallery for natural hiſtory; ſo that this large hall was ſoon fitted up with all the ſtate and magnificence in which it now appears. In the building where Cuvier now reſides, is a choice collection of ſkeletons of men, quadrupeds, and birds.

It muſt be obſerved, that as natural hiſtory and botany are almoſt unlimited, the deſcriptions which I give of the natural treaſures of the garden, green houſe, and gallery, cannot but be ſuperficial.

Two very promiſing ſtudents of natural hiſtory now reſide in Paris; M. Neils Hoffman Bang, and M. Wilken Horneman, who has publiſhed, and received a premium for, his deſcriptions of Daniſh plants. Both

the gentlemen attend the muſeum and garden, and are intimately acquainted with the French naturaliſts, Juſſieu, Lacepede, Lamark, Cuvier, Brogniart, Thouin, and others; and they certainly intend to publiſh their obſervations on the muſeum and the botanic garden.

The library, which is on the ſecond floor, by the ſide of the gallery, contains from nine to ten thouſand volumes, relating to botany and ſeveral other branches of natural hiſtory. On the walls are hung ſeveral very maſterly paintings of plants and animals, executed by the ſtudents at the muſeum. All remarkable plants and animals are drawn on vellum paper, and laid up in common bindings: the number of parcels of this kind is very conſiderable. This library was formed in the time of Lewis the Fifteenth, and has been continually increaſing. It is open every day, excepting decade days, from eleven till two o'clock.

The menagerie ſeems to be ſeparated into two parts, the one for mild animals, and

and the other for the wild and ferocious. Between two of the long alleys, on the right hand, as one enters from the city, and about the middle of the garden, are inclosures of very fine railing, within which are the mild animals, such as camels, dromedaries, African oxen, East Indian deer, several kinds of sheep, Angora goats, &c. &c. some of which have even propagated their species in this garden. The other part of the menagerie is for ferocious animals, which are kept on the left hand side, in a low building with different apartments. Here are a lion, four lionesses, a white bear, and several Alpine bears (which formerly had free possession of the state den of Berne, but now inhabit that of Paris,) a wolf, an African porcupine, sea bears, &c. It is remarkable that there is a dog here which continually lives in company with a young lioness.

In a large cage are contained different birds of prey: such as eagles, griffins, hawks, storks, &c. On the left hand, on

entering the garden, and behind the green houſe, are ſeveral buildings. In one of them are two grey elephants from Holland; and in another, two oſtriches, a caſſowary, and ſome antelopes. In other parts of the garden, are incloſures for land and ſea fowls, and three ponds of ſpring water for fiſhes.

The amphitheatre is a remarkable building, which faces the garden on the left ſide. This lecture room indeed is an amphitheatre in its true acceptation, that is, the forms are all conſtructed in ſemicircles, and riſe regularly one above another. At the centre below ſtands the lecturer. I attended a lecture on chemiſtry, delivered in this amphitheatre, by Brogniart. It was difficult to hear and underſtand him; but I cannot ſay with certainty, whether the cauſe was to be looked for in the voice of the ſpeaker, or in the conſtruction of the building. I was, however, rather inclined to aſcribe it to the latter, as the voice muſt neceſſarily be confuſed by reverberation. In

the

the ſame building there is a chemical laboratory.

The ſuperintendants of this muſeum are Juſſieu, who is principal director and profeſſor of rural botany, and the following managers, viz. Daubenton, profeſſor of mineralogy; Fourcroy, of general chemiſtry; Brogniart, of technical chemiſtry; Desfontaines, of botany; Geoffroy, of the zoology of quadrupeds and birds; Lacepede, of the zoology of reptiles and fiſhes; Lamark, of the zoology of inſects, worms, and teſtaceous animals; Portal, of human anatomy; Mertrud, of the anatomy of animals; Thouin, of gardening; Faujas, of geology; Vanſpaendonck, of ichnography, and who alſo teaches the ſtudents to take ſketches of animal and vegetable objects, &c. Cuvier is adjunct in the anatomy of animals. All theſe profeſſors deliver their public lectures in rotation, and in the ſummer months only. The other officers conſiſt of a principal and ſub librarians, two keepers of the gallery for natural hiſtory, a gardener

gardener and a ſecretary. The aſſiſtant profeſſors are, one in mineralogy, two in zoology, and one in botany. Two Captains conſtantly keep guard with their veterans at the muſeum. Moſt of the profeſſors and officers have a free reſidence in buildings belonging to this muſeum.

There formerly ſtood in the library of the muſeum a ſtatue of the celebrated Buffon, of Parian marble, and as large as life. During the jacobin government, it was taken down, but preſerved from damage. It is ſaid that it will be reſtored to the former honourable ſituation, deſervedly due to the inanimate repreſentative of Buffon, whom the French have generally named the ſecond Pliny.

Juſt below the entrance from the city into the botanical garden, and on the left hand, there is to be ſeen a plantation of trees and ſhrubs, which riſe up to a conſiderable height, and have a beautiful appearance. In this fine grove formerly ſtood, under a noble cedar of Libanon, a marble

buſt

buſt of Linnæus, the Swediſh naturaliſt, and the inventor and founder of the modern ſyſtem of natural hiſtory. This buſt was deſtroyed, at the time when the *peuple ſouverain* amuſed themſelves with ſpreading ruin and devaſtation. The cedar of Libanon, either by a cannon ball or ſome other violence, then loſt its majeſtic top. Thoſe Vandals deſtroyed every memorial and monument, without any diſcrimination whatever. They even demoliſhed the tombs, and dug up the bodies, of the moſt meritorious of their countrymen; not exempting that of the great Turenne himſelf, who had been, more than once, the deliverer of France. His ſacred remains, in which was ſtill viſible the wound of the cannon ball by which he fell, in the ſervice of his country, were treated by thoſe barbarians in the moſt inhuman and contemptible manner. The mortal part of that great General lay in the muſeum, ſhamefully expoſed among the ſkeletons of quadrupeds and birds; till it was removed by the orders of Francis de Neufchateau,

chateau, and placed in an apartment of the amphitheatre, where it is ſet upright in a glaſs caſe.

Before I take my leave of the Muſeum for Natural Hiſtory, I muſt obſerve, that it contains a great number of cheſts ſtill unpacked, which are full of curious objects brought hither from conquered countries. I have been told by men, who had every opportunity of being well informed, that thoſe cheſts incloſe a collection as intereſting and extenſive as that already depoſited in the muſeum, in which there is no room for more objects without additional buildings.

LETTER

LETTER IX.

THE CENTRAL MUSEUM FOR ARTS AT PARIS, AND THE MUSEUM FOR THE FRENCH SCHOOL AT VERSAILLES.

The Central Muſeum, a general Collection of Statues, Paintings, &c—Entrance—Gallery of Apollo—Picture Gallery five hundred feet long—Pictures and Statues from Italy, greatly injured on the Journey—Catalogues of Paintings brought from Italy, &c. which greatly exceeded the Author's Expectations—Saloon of Lacoön to be prepared—Exhibition of the Works of French Painters, Statuaries, Draughtſmen, and Engravers now living—General Muſeum for French Paintings.

NEAR the Louvre, or National Palace for Arts and Sciences, is a building appropriated to collections in the fine arts of drawing,

drawing, painting, and ſculpture, under the name of the *Central Muſeum of Arts*. All the foreign pieces of art formerly ſeen in France, together with the paintings and ſtatues which have been ſince acquired from Belgium, Lombardy, Venice, Rome, and other States, either by the force of conqueſt, or by expreſs conditions in treaties of alliance and neutrality, are now formed into one general collection. The large and ſtrong four-wheeled carriages which brought thoſe ſubjects of art from Italy, are now ſtanding in the garden of the Louvre.

The entrance to the Muſeum of Arts is from a large ſquare in front of the Louvre, and cloſe by a corner formed by this ſquare and that palace. All the way in entering, ſtatues of bronze, and buſts of marble, are preſented to view in porticoes. In the front room, among other pieces of ſculpture, are four beautiful coloſſal ſlaves, which once ſtood by the pedeſtal of the ſtatue of Louis XV. in the *Place des Victoires*. Below

low the entrance into the ſtair-caſe are ſeveral ſtatutes, which have been brought from Italy, and on the different landing places of theſe noble ſtairs, are various fine models of Gibs. On entering the ſecond floor there is a large front room, or ſaloon, with ſky-lights at top. On the left hand is the gallery of Apollo, containing only ſketches and ſome crayon paintings, moſt of which were brought from Holland, Belgium, and Italy. On the right hand, is an excellent and ſingularly extenſive picture gallery. It is a room of no leſs than five hundred feet in length, and was formerly filled with paintings, ſmall ſtatues, buſts, idols, vaſes, mechanical contrivances, mathematical and philoſophical inſtruments, models of buildings; and, in ſhort, it was that kind of diſorderly jumble which ſome virtuoſos are fond of amaſſing, in what they call a cabinet of curioſities. This great gallery is at preſent undergoing an alteration and new arrangement, on which account it has been ſhut up for the whole ſummer.

The

The managers of this muſeum announced, on the 18th Brumaire, in the ſeventh year, "that they had made conſiderable progreſs "in arranging and putting into proper "points of view, the paintings produced by "the Flemiſh and French Schools, in a "part of the great Gallery, which they "intend opening as ſoon as poſſible; that "they will then publiſh a new catalogue or "explanation of the paintings in the gal-"lery of Apollo, and will work with all "poſſible diſpatch, in preparing the place "where the Italian ſtatues are to be ex-"hibited to public view."

The Italian paintings have been publicly explained in two catalogues. The firſt of which extended from the 18th of Pluvioſe to the 30th of Prairial, ſixth year, (from the 6th of February to the 18th June, 1798,) and included the pieces brought from Lombardy, that is, from Parma, Piacenza, Milan, Cremona, Modena, Cento, and Bologna. To this catalogue have ſince been added, ſome Italian pieces from Verſailles,

in

in order to collect the whole Italian school into one point of view.

The managers have had the candor to acknowledge, that some of those masterpieces of art are in such bad condition that they cannot be exhibited. This seems tantamount to a confession, that they have been much injured on the journey, if not totally abraded and destroyed. In particular, it is known, that an excellent portrait of Raphael, by Foligno; the Holy Virgin and some Saints, by Bellini; the repast at the house of Levi, by Paul Veronese; the Marriage of Cana, by the same master; St. Peter, the martyr, by Titian; and several of the statues brought from Italy, have suffered greatly from the length of the journey.

I shall subjoin the titles of the pieces mentioned in the first catalogue, or explanation, together with the names of the artists, and the places from whence they were brought.

By

By Albani (Franciſco) who died in 1660:

1. The Birth of Mary, from Bologna.
2. Diana and Acteon, from Verſailles.
3. Apollo with Admetus, do.
4. Cybele's Triumph, do.
5. The Holy Family, do.
6. Reſting on the Journey to Egypt, do.
7. The Annunciation of Mary, do.
8. The ſame on a ſmaller ſcale, do.
9. Chriſt, as ſeen by Mary Magdalen, do.

By Bellini (Giovanni) who died in 1512:

10. His own portrait, his brother Gentil Bellini being included in the ſame piece, from Verſailles.

By Carraccio (Hannibal) who died 1609:

11. Chriſt in Mary's arms, from the Capuchin at Parma.
12. St. Luke and Mary, from Modena.
13. The Reſurrection of Chriſt, from Bologna.
14. Do. on a ſmaller ſcale, from Verſailles.
15. Chriſt aſleep, do.
16. The

16. The Birth of Chriſt, do.

17. Chriſt laid in the Tomb, do.

18. Abraham's Offering, do.

19. John preaching in the Wilderneſs, do.

20. A Concert, by Water, do.

21. The Stoning of St. Stephen, do.

22. The ſame deſigned and executed in a different ſtyle, do.

By Carraccio (Auguſtin) executed in 1602.

23. St. Cecilia and St. Magdalena, from Parma.

24. Mary's Aſcenſion, from Bologna.

25. St. Jerome's Converſion, a maſterpiece of Caraccio, taken from Bologna.

By Carraccio (Ludovico) who died in 1619:

26. Mary, Joſeph, and St. Francis, from Cento.

27. Mary, as ſeen of St. Hyacinth, from Bologna.

28. The calling of Matthew, from Bologna.

29. The

29. The Interment of Mary, from Piacenza.

30. The Apoſtles at Mary's Grave, do.

31. The Annunciation of Mary, from Verſailles.

32. Mary and the Child Jeſus, do.

33. St. Bernhard delivering the city of Carpis, from Modena.

The Four Elements, painted by the three brothers Carraccio's.

By Carraccio (Ludarg).

34. The Earth, repreſented by Flora.

35. Water, by a Nymph ſitting in a large muſcle-ſhell, drawn by Dolphins.

By Carraccio (Auguſtin).

36. Fire repreſented by Pluto, and Hell.

By Carraccio (Hannibal).

37. The Air, repreſented by Venus ſitting on a cloud.—The laſt four paintings were brought from Modena.

By Cavedone (Giacome), who died in 1660.

38. St. Petronius and St. Eloi, from Bologna.

By

By Correggio (Antonio Allegri) who died in 1534.

39. Mary, with the Child Jeſus, St. Jerome, and Magdalen. This is the greateſt maſter-piece of the art of painting. The King of Portugal, in the year 1749, bid for it 40,000 zechinas, or 18,000l. ſterling: it was taken from Parma.

40. The Holy Family, reſting on their journey to Egypt.—The King of Poland, in the year 1750, offered for this piece 20,000 zechinas, or 9,000l. ſterling, from Parma.

41. The taking down from the Croſs.

42. The Execution and Martyrdom of St. Placide and St. Flavia.—Both theſe pieces (41 and 42) are very excellent, and were brought from Parma.

By Zampieri (Dominico) who died in 1641.

43. Mary with a Bunch of Roſes, from Bologna.

44. St. Agnes's Martyrdom, do.

45. David playing on the Harp, from Verſailles.

46. St. Cecilia, do.

47. The curſing of Adam and Eve.

48. St. Paul raiſed in a Trance to the Third Heaven, do.

49. The triumph of Love, do.

50. Mary and St. Antonius of Padua, do.

51. Mary drawing water with a muſcle-ſhell, do.

By Doſſi, who died in 1560.

52. The Circumciſion of Chriſt, from Verſailles.

53. Chriſt proclaimed to the Shepherds, from Modena.

54. Mary with the Child Jeſus, from Verſailles.

By Herrari (Gaudenzio) painted about 1540.

55. The Apoſtle Paul, from Milan.

56. The Birth of Chriſt, from Verſailles.

By Feti (Dominico) who died in 1624.

57. Melancholy, under the emblem of a pale young lady, from Ecouen.

By Titio Girofalo (Benvenuto) who died in 1559.

58. His own Portrait, drawn by himſelf, from Verſailles.

59. Mary,

59. Mary, St. Luke, and John the Baptiſt, do.

60. The Holy Family, from Bologna.

61. Another Holy Family, from Verſailles.

By Genhari (Cæſar) who died in 1648.

62. Magdalen in the Wilderneſs, from Cento.

63. Mary's Marriage with Joſeph, from Modena.

64. Mary with the Child Jeſus, from Cento.

By Bonzi (Peter Paul).

65. Latona's Vengeance, from Verſailles.

By Barbieri (Franciſcus Guerchin) who died in 1666.

66. The Bliſs of Paradiſe, from Cento.

67. Mary, Joſeph, and ſeveral other Saints, do.

68. Chriſt giving the Keys of the Church to St. Peter, do.

69. Wilhelm, Duke of Aquitain, takes the cowl, from Bologna.

70. St. Francis and St. Benedict, from Cento.

71. St. Peter faſtened to the Croſs, from Modena.

72. Chriſt is ſeen by his Mother, from Cento.

73. The Execution of St. John and St. Paul, from Modena.

74. Mary's Viſit to Elizabeth, do.

75. Mars, Venus, and Cupid, do.

76. The Circumciſion of Chriſt, from Bologna.

77. Mary is ſeen by St. Bruno, do.

78. Trinity in Unity, or St. Geminius, St. Francis, and St. Sebaſtian, from Modena.

79. The Marriage of St. Catherine, do.

80. Salome with the head of John the Baptiſt, do.

81. Mary is ſeen by St. Jerome, from Cento.

82. The Virgin Mary with a Child, from Modena.

83. St.

83. St. Francis obtains an Impreſſion of the Wound of Chriſt, do.

84. Mary, St. Germinius, John the Baptiſt, St. George, and St. Peter the Martyr, do.

85. St. Bernard receives from Mary the rules of his order, from Boſco.

By Guido (Reni) who died in 1642.

86. The compaſſionate Conduct of the Saints, who are the protectors of Bologna. —This is held to be one of the beſt pieces of Guido Reni, taken from Bologna.

87. St. Roch in Priſon, from Modena.

88. The ſlaughter of the Innocents.—This piece was drawn, to ſhew thoſe who envied him, that he could paint not only ſentimental, but alſo hiſtorical pieces, from Bologna.

89. Job reſtored to his former proſperity, do.

90. The Purification of Mary, from Modena.

91. Mary with the Child Jeſus, from Verſailles.

92. Uniſon of the Arts of Deſign and Painting, do.

93. The Child Jeſus aſleep, from Modena.

94. Chriſt on the Croſs, do.

By Julius Pipi Romano.

95. His Portrait, painted by himſelf, from Verſailles.

96. The Shepherds worſhip the Child Jeſus, do.

97. Venus and Vulcan, do.

98. The triumph of Titus Veſpaſian, do.

By Lana (Ludovico) who died in 1646.

99. Death of Clarinda, from Modena.

By Lanfranchi (Giovanni).

100. St. Peter and St. Paul taking leave of one another, from Verſailles.

By Lelio Orſi, of Novellara, who died in 1587.

101. Virgin Mary, St. Joſeph, and St. Michael, from Parma.

By Leonardo da Vinci, who died in 1519.

102. Virgin Mary and St. Anne, from Verſailles.

103. Por-

103. Portrait of Jocund, do.

104. Portrait of a Woman, do.

105. Salome, with John's Head, do.

By Licinio (Bernardino).

106. A Holy Family, from Milan.

107. John the Baptiſt, when a Child, do.

By Mazzola (Girolamo) who flouriſhed about 1550.

108. The three Kings worſhipping the Child Jeſus, from Parma.

By Mola (Pietro Franciſco) who died in 1666.

109. John preaching in the Wilderneſs, from Verſailles.

By More (Franceſco Torbido) who flouriſhed about 1500.

110. Charles the Fifth in a pigmy form, from Verſailles.

By Palma (Giacomo) who died in 1596.

111. A Holy Family, from Verſailles.

By Mazzuoli (Franceſco Parmeſano) who died in 1580.

112. The Virgin Mary and Holy Margaretta, from Verſailles.

113. Mary with Jesus and John the Baptist, when a Child, from Versailles.

114. The Holy Family, do.

By Perin del Vaga, called Buonacorsi, who died in 1547.

115. The Muses and Pierides challenging one another, from Versailles.

By Pietro Perusino Vanucci, who died in 1524.

116. Virgin Mary, St. Jerome, and St. Augustine, from Versailles.

By Pietro Berettini da Cortone, who died in 1669.

117. Mary's Nativity, from Versailles.

By Giacome Pantorme Caruccio, who died in 1556.

118. An engraved Portrait, from Versailles.

By Procaccini Camillo, who died in 1626.

119. Mary, St. George, and other Saints, from Modena.

By Julius Cæsar Procaccini, who died in 1621.

120. St. Sebastian, from Milan.

By

By Raphael Sanzio, who died in 1521, *aged* 37.

121. St. Cecilia—a moſt excellent piece, from Bologna.

122. Chriſt in celeſtial Bliſs, with St. Paul and St. Catherine, from Parma.

123. Child Jeſus, lying with the Child John, from Verſailles.

124. Plenty, under the emblem of a Woman, do.

By Salvator Roſa, who died in 1673.

125. Purgatory, from Milan.

126. Saul, the Witch, and the Shade of Samuel, from Verſailles.

By Bartolemeo (Schedoni) who died in 1615.

127. Chriſt in the Tomb, from Parma.

By Andrea Solario.

128. Mary giving Jeſus the Breaſt, from Verſailles.

By Leonello Spada, who died in 1621.

129. St. Francis offering a Flower to Chriſt, from Modena.

130. The Execution of St. Chriſtopher, do.

131. Joſeph's Charity, do.

132. The Return of the Prodigal Son, do.

By Tiarino (Alexander) who died in 1668.

133. Joſeph repents of his ſuſpicions of Mary, from Bologna.

134. The Marriage of St. Catherine, from Modena.

By Tintoret (Giucomo Robuſti) who died in 1594.

135. Whole Length Portrait of a Man, from Verſailles.

By Tiziano Vecelli, who died in 1576.

136. Chriſt bearing the Crown of Thorns, a maſter-piece, from Milan.

By Breughel (Jean) who died in 1642.

THE FOUR ELEMENTS, VIZ.

137. The Air, repreſented by Urania.

138. The Earth, repreſented by Paradiſe.

139. Water,

139. Water, repreſented by Naiades, and the Sea by Fiſhes and Water-fowls.

140. Fire, repreſented by Forges and Cannon-founderies. — Theſe four pieces were taken from Milan. The execution is excellent, and 150,000 livres, or £6,250 were once offered for them.

141. Daniel in the Lion's Den, from Milan.

Out of theſe one hundred and forty-one paintings, which have been exhibited from the 18th of Pluvioſe to the 30th of Prairial, there were thirty-ſix formerly in France: this reduces the number brought hither from Italy to 105. They will all be hung up in the Great Gallery, as ſoon as it is ready for their reception.

The other catalogue or explanation conſiſts of pieces brought from Venice, Verona, Mantua, Peſaro, Fano, Loretto, and Rome. It begins with the 18th Brumaire, 7th year, or 8th of November, 1798, and contains the following paintings:

By Alfani (Dominico di Paris) who died in 1553.

1. Mary, St. Franciſcus, and Antonius of Padua, from Peruſa.

By Baroccio (Frederigo) who died in 1622.

2. Jeſus taken down from the Croſs.—This is one of the beſt pieces of this artiſt, and was taken from Peruſa.

3. The calling of St. Peter and St. Andrew, from Peſaro.

4. St. Micheline, from do.

5. The Annunciation, from Loretto.

6. The Circumciſion of Chriſt, from Peſaro.

7. Mary, St. Antoinius, and St. Lucy,

8. The Reſurrection of Lazarus, from Venice.

By Baſſano (Leandro da Ponte) who died in 1623.

By Bellini (Giovanni) who died in 1516.

9. Chriſt in the Tomb.—This piece has been greatly injured, and is in a bad condition, from Venice.

By

By Caravaggio (Michael Angelo Amerigi).

10. Chriſt carried to the Sepulchre.—This is looked upon as the beſt piece of this maſter, and was taken from Rome.

By Caraccio (Hannibal) who died in 1609.

11. Birth of the Virgin Mary, from Loretto.

12. Chriſt lying on Mary's Boſom, from Rome.

By Caraccio (Auguſtin) who died in 1602.

13. St. Jerome's Change in his laſt Moments.—This is the maſter-piece of Carraccio, and was taken from the Carthuſian Church of Bologna.

By Giovanni Contarino, who died in 1615.

14. Mary, St. Sebaſtian, and ſeveral Saints, from the Doge's Palace at Venice.

By Dominico Zampieri, who died in 1641.

15. St. Jerome's Converſion.—This is Dominico's

Dominico's beſt piece, and was taken from Rome.

By Benvenuto Tizio Girofalo, who died in 1559.

16. The Holy Virgin and St. Catherine, from a gallery at the Capitol of Rome.

By Barbieri (Giov. Franciſco), called Guercini, who died in 1666.

17. St. Petronille—the beſt piece of this artiſt, taken from Rome.

18. St. Thomas's Unbelief, from the Vatican at Rome.

By Guido Reni, who died in 1642.

19. The Crucifixion of St. Peter.—This is eſteemed one of the beſt works of Guido, and was taken from the Vatican.

20. Chriſt giving the Keys of the Church to St. Peter, from an altar-piece at Fano.

21. Mary, St. Jerome and St. Thomas. This too is one of Guido's beſt pieces, in another ſtyle. It was taken from the cathedral church of Peſaro.

22. For-

22. Fortune. This painting is of great celebrity, and was taken from the Capitol of Rome.

By Fermo Guiſoni, who flouriſhed about 1568.

23. The Calling of St. Peter and St. Andrew, from St. Peter's church at Mantua.

By Mantegna (Andreas) who died in 1517.

24. The Holy Virgin Triumphant. This was taken from the altar piece of the Philippine church of Mantua, which was built on account of a victory gained by F. F. Gozangue, Duke of Mantua, in the year 1496.

25, 26, 27, are three ſeparate paintings, joined together in one frame. 25 is the middle piece, and is the Holy Virgin. 26 is on the right ſide, and contains John the Baptiſt, St. Lawrence, and St. Benedict, and a Biſhop. 27, on the left ſide, exhibits St. Peter, St. Paul, John the Evangeliſt, and St. Zeno. This groupe is in an ornamented frame,

frame, with imitations of feſtoons and basreliefs in the antique manner.

28. Chriſt praying in the Garden.

29. Chriſt on the Croſs between the Thieves.

30. The Circumciſion of Chriſt.

Theſe ſix pieces, 25, 26, 27, 28, 29 and 30, were taken from the great altar of St. Zeno's church at Verona.

By Paolo Cagliari Veroneſe, who died in 1588.

31. The Report at the houſe of Simon. This is one of the firſt pieces of P. Veroneſe, and was taken from St. Sebaſtian's cloiſter at Venice.

32. The Virgin, St. Jerome, and many Saints, from the Sacriſty of St. Zechariah's nunnery at Venice.

33. The Martyrdom of St. George. This piece has always been eſteemed one of the beſt of P. Veroneſe, and was taken from the high altar of St. George's church of Verona.

34. St.

34. St. Barnabas recovered from his Sickneſs, do.

35. The Rape of Europa, from the Doge's palace at Venice.

36. Jupiter puniſhes Calumniators with his Thunder, do.

37. Juno pours out Riches over Venice, do.

38. St. Mark crowns the Virtues, do.

39. St. Antonius's Temptation by Devils, from the cathedral church of Mantua.

40. A Holy Family, from a private collection in the Bevilacqua palace of Verona.

41. Chriſt lying in the Tomb, do.

42. Portrait of a Lady, do.

By Pietro Vannucci, called Perrugin, who died in 1524.

43. Aſcenſion of Chriſt: held to be one of the beſt productions of this artiſt.

44. The Three Kings worſhipping the Child Jeſus.

45 The Baptiſm of Chriſt.

46. The Circumciſion of Chriſt.

The

The four laſt pieces were taken from the Benedictine church of Peruſa.

47. The Family of the Holy Virgin, taken from the hoſpital church of Verona, and eſteemed the very beſt piece of this maſter.

48. Mary and ſome Saints, who are protectors of the town of Peruſa, from a chapel at Peruſa.

49. Mary, St. Auguſtine, and St. Jerome, from an Auguſtine Sacriſty at Peruſa.

50. The Marriage of the Virgin Mary, from the cathedral church of Peruſa.

51. The Eternal Father, from a Benedictine church at Peruſa.

52. St. Sebaſtian and St. Agatha.

53. John the Evangeliſt.

54. The Apoſtle St. James and a Biſhop.

Theſe three paintings are from an Auguſtine Sacriſty of Peruſa.

55. Michael, the Archangel.

56. St. Bartholomew, the Apoſtle.

57. St.

57. St. Apollius praying.

Theſe three were alſo taken from the Auguſtine Sacriſty.

58. The Prophet Jeremiah.

59. The Prophet Iſaiah.

The above two from the Benedictine church of Peruſa.

By Licinis da Perdon (Giov. Antonio) who died in 1540.

60. St. Lawrence, Juſtinian, and other Saints, from the church of Madonna del Orto at Venice: is held to be a maſter piece.

By Pouſſin (Nicolai) who died in 1665.

61. Martyrdom of St. Raſmus, from the Vatican.

By Raphael Fanzio, who died in 1520.

62. Mary taken up to Heaven.

63. The Annunciation.

64. The Three Kings worſhipping the Child Jeſus.

65. The Three Kings preſented in the Temple.

Theſe four paintings were taken from the Sacriſty

Sacriſty of St. Francis's church of Peruſa. They are Raphael's juvenile productions, having been painted when he was but ſeventeen years of age. Lord Briſtol bid for them 80,000 francs, or about 3,340l. ſterling.

66. St. Benedict, St. Placide, and St. Cecilia, from the Benedictine church of Peruſa.

67. The Chriſtian Virtues, Faith, Hope, and Charity, do.

68. Mary crowned in Heaven, after her Aſcenſion; from the Nunnery of Monteluce, near Peruſa.

69. The Athenian School is drawn on grey paper, with white chalk, and ſhaded with black. It was taken from the Ambroſian library at Milan, and was the firſt ſketch of the *al Freſco* painting at the Vatican. This is without doubt the fineſt compoſition of the greateſt painter who ever appeared.

70 The Transfiguration of Chriſt on Mount Tabor, taken from the high altar of St.

St. Peter's church at Rome. This maſterpiece is the laſt and moſt perfect production of the extenſive and prolific talents of the great Raphael. The painter died ſoon after his entering on the thirty-ſeventh year of his age. He executed this piece on the requeſt of Julius de Medicis, then Cardinal and Vice Chancellor, and afterwards Pope Clement the Seventh. Raphael received for his labour 655 ducats.

By Sacchi (Andrea) who died in 1661.

71. St. Remuald, taken from the high altar of the church of St. Remuald, was always eſteemed one of the beſt pieces in Rome.

72. St. Gregory's Miracle, from the Vatican.

Tintoret (*Giacome Robuſti*) *who died in* 1540.

73. St. Mark liberates a Slave. This is one of the artiſt's beſt pieces; and was taken from the Fraternity of St. Marco at Venice.

74. Celeſtial Bliſs. This is only a ſketch: it

it is a draught of the large one at the Doge's palace in Venice, and was taken from a collection of the Bevilacqua palace at Verona.

75. St. Agnes raiſes up the Ruler's Son, from the church of *Madonna del Orto* in Venice.

By Tiziano Vecelli, who died in 1576.

76. Religion, from the Doge's palace at Venice.

77. The Aſcenſion of Mary, from the cathedral church of Verona.

78. The Martyrdom of St. Laurence. This is one of the moſt celebrated pieces of Tizian, and was taken from the Jeſuit's church at Venice.

By Moſes Valentin, who died in 1632.

79. The Martyrdom of St. Martinian, from the Vatican.

The following are by various artiſts:

80. The Three Prophets, by ſome maſter of the Venetian ſchool. It was purchaſed at Arles.

81. Chriſt

81. Chriſt laid in the Grave, painted by *Pietro Vannucci Perrugino*, and taken from the Auguſtine church of Peruſa.

82. The Eternal Father, painted by Guido Reni, and taken from the cathedral church of Peſaro.

Eight bas-reliefs in bronze, repreſenting hiſtorical circumſtances reſpecting Mauſolus, King of Caria.

83. Mauſolus ſeized with a dangerous Diſeaſe, in the midſt of his Triumph.

84. His Queen, Artemiſia, offers a Sacrifice to the Gods, and ſupplicates them for the Recovery of her Huſband.

85. Mauſolus dies in the midſt of his diſconſolate Family and People.

86. Artemiſia gives him a ſumptuous Funeral, and erects to his Memory a magnificent Monument.

87. Charon carries in his Boat the Shade of Mauſolus to the Regions of the Dead.

88. Artemiſia celebrates his Memory by Poems and Orations.

89. Artemiſia reunited with Mauſolus.

90. Fame

90. Fame publiſhes their connubial Affection and mutual Attachment.

Theſe eight beautiful bas-reliefs, of ſomething more than a foot in length, and rather leſs than a foot in height, were taken from the church of St. Fermo Maggiore at Verona. They were applied to the mauſoleum belonging to the family of *della Torre*.

It is to be obſerved, that they were executed by Guillo della Torre, whoſe various medals and other productions in bronze are now known.

BUSTS.

91. Raphael's Buſt, in marble.

92. Hannibal Carraccio's Buſt, in marble.

93. Andrea Sacchi's Buſt, in burnt clay.

94. Andrea Mantegna's Buſt, in bronze.

This ſecond collection I have viſited more than once. I went there the firſt time poſſeſſed with the idea of ſeeing ſomething great and beautiful in the enchanting art of painting; but I muſt ſay that the works

works of Raphael, Guido Reni, Paul Veroneſe, Andreas Sacchi, and other great maſters, exceeded my moſt ardent expectations. Yet I cannot forbear mentioning, that I alſo ſaw ſome pieces which were not at all pleaſing to me: but they all exhibit authentic traits of the times, and ought to be there, as they form a hiſtory of the art, its progreſs and perfection in deſign, colour, light, ſhade, &c.

With reſpect to the ſtatues brought from Italy, a plan has been drawn of the order in which they are to be ſet up, in a number of adjoining rooms, which are to be prepared and embelliſhed. In the middle of each, is to be erected a large ſtatue of ſuperior beauty, ſuch as Laocöon, the Farneſian Hercules, the Apollo Belvidere, &c. the rooms to derive their names from theſe ſtatues, and to be called the Saloon of Laocöon, the Saloon of Hercules, &c. &c. the ſtatues of leſs ſize and beauty are to be ſet up in thoſe ſaloons.

In the Great Saloon, or Gallery of the

Central Muſeum, where the Italian paintings juſt noticed are hung up, are annually exhibited the performances of French artiſts now living, together with thoſe of their pupils. Such a collection was exhibited in the ſixth year, for four weeks, commencing on the 1ſt of Thermidor, or the 19th of July, 1798. It conſiſted of four hundred and forty-two pieces, ſome drawn in oil colours, ſome in water colours, and ſome with Indian ink. A collection thus extenſive, and executed by ſo many different young artiſts, muſt neceſſarily poſſeſs different degrees of merit. *General Angereau*, on the *Pont d'Arcole*, painted by Charles Thevenin, is a large piece, wherein every thing is of its natural dimenſions, and ſeems to me to be very well done. Angereau, obſerving that the column which is to aſſault the bridge, does not proceed briſkly enough, mounts his horſe, and, with a ſtandard in his hand, advances before the column, though oppoſed by a hot fire from three Auſtrian batteries. His flag and hat

are

are ſhot through; an inferior officer is ſhot, and dies by his ſide; and a lad, who is a drummer, pulls Angereau back, ſignifying his dread of the danger to which the General expoſes himſelf: the entrance of the bridge is ſeen, and ſome of the wooden rails ſhot in pieces.

Apollo and Urania, very well painted by Charles Meinier.

The Death of General Marceau, painted by Lejeune, an officer of the engineers, is alſo a good piece. The General was ordered to poſt himſelf in a wood near Hocſtbach: while reconnoitring the wood, he was ſhot by an Auſtrian chaſſeur from behind a large tree. The place and country around it are drawn from nature, and the whole is well executed.

Among the portraits done with oil colours, and as large as life, that of Profeſſor Charles ſeemed to me to be very happily deſigned, and well painted. He is drawn in a kind of grey ſilk morning gown, in which, I am told, he uſed to lecture on

electrity. In his hand is a ſolar microſcope, which is a very proper emblem, as he had a remarkably fine apparatus for optical experiments, and his lectures on that ſcience, which he delivered in the ſummer ſeaſon, were particularly admired.

The ſtatuary performances conſiſt of forty-nine pieces. Among them is a buſt of the worthy Daubenton, at the age of eighty-three. There are eleven architectural drawings, and twenty-ſix copper-plate prints, among which is a fine portrait of *General Marceau*, engraved by his brother-in-law *Sergent*. This piece is extremely well coloured.

I have to mention in this place, that there is at this time prepared, at the uninhabited palace of Verſailles, "A General Muſeum for the Paintings of the French School." This muſeum occupies eight large apartments, on the upper floor. The paintings have been all taken from cloiſters, churches, and collections belonging to the emigrants, and to the former government. The whole

is

is well arranged, and has a very good effect. It contains a number of excellent paintings; but there are alſo ſome which have but a moderate appearance, when examined after one has ſeen the great maſter-pieces of painting which have been brought thithe from Italy.

LETTER X.

OF THE NATIONAL OBSERVATORY AT PARIS.

The Danes firſt erected an Obſervatory—The Pariſian Obſervatory, as a Building—Was decaying before the Revolution—Injured during the Reign of Terroriſm—M. Jeaurat, an old and able Aſtronomer, now thruſt down into a Cellar, and ill provided for—The Obſervatory under Repair—Aſtronomical Inſtruments, by Dollond, &c.—The French have but lately uſed tranſit Inſtruments—Large Teleſcope, a mean Inſtrument, and almoſt uſeleſs.—Teleſcope with Specula of Platina—An Achromatic, by Rochette, far inferior to one of the ſame Dimenſions, by Nairne and Blunt—The Paris Obſervatory inferior to thoſe of Greenwich, Edinburgh, Copenhagen, &c.

YOU will readily believe that the National Obſervatory appeared to me one of the moſt intereſting places that I had ſeen.

It

It is ſituated near the farther end of *Rue St. Jacques*. The length of this ſtreet, from *Pont Notre Dame* to the *Barriere*, is 1275 toiſes. The obſervatory ſtands 150 toiſes from the Barrier, on an eminence, and, like the whole of Paris, on a chalky baſis. This outlet of the city not being much built upon, there is much open ſpace about the obſervatory. It is not incommoded by ſmoke and damp, and poſſeſſes a free air, and a fine proſpect. We Danes claim the honour of having been the firſt nation in Europe who dedicated public temples to the ſervice of Urania, or, in other words, erected ſolid and durable obſervatories. Who has not heard of the immortal Tycho Brahe's Uraniburg at Huen? Who does not know that, after this great man's exile from Denmark, Chriſtian the Seventh, without doubt, lamenting this loſs to the ſciences, cauſed the round tower at Copenhagen to be built, and there fitted up an obſervatory for Chriſtian Longomontanus, the moſt famous

diſciple of Tycho? The obſervatory at Copenhagen was finiſhed in 1637: and it was not till thirty years after, that the obſervatories of Paris and Greenwich were built, almoſt at the ſame time. The eſtabliſhment of the Academy of Sciences, and of the obſervatory at Paris, owe their origin to the anxiety which the great Colbert,* Miniſter to Louis the Fourteenth, felt for the promotion of ſciences. The obſervatory was erected by the celebrated French artiſt Perrault, who has paid more attention to the beauty of the edifice, and to his own fancy as an architect, than to the accommodation of aſtronomers. The building conſiſts of two very large and high ſtories; all the floors are in good order, and on the roof is a platform or gallery. Under the building are caves of remarkable depth, and which I ſhall hereafter particu-

* Colbert was a cadet of the family of the Cuthberts of Caſtle Hill near Inverneſs. See the Statiſtical Account of Scotland, article *Inverneſs*.

larly

larly notice. The fineſt front is the leaſt ſeen, as it faces a garden belonging to one of the reſiding aſtronomers, who at preſent is Mechain; ſo that from the common entrance in *Rue St. Jacques*, the obſervatory appears to ſome diſadvantage. This eſtabliſhment was falling into decay during the latter years of the monarchy; at leaſt ſome of the inſtruments were ſo old, that others, ſuitable to the preſent improved ſtate of aſtronomy and mechanics, had become abſolutely neceſſary. Count Caſſini, who was at that time Director of the Obſervatory, repreſented to the Government the deficiencies complained of, and had actually begun to make them good. But the revolution took place, Caſſini was obliged to quit the obſervatory, and the building and inſtruments were greatly injured in the times of terroriſm. When that direful period of frenzy was paſt, and the arts and ſciences were again thought of, aſtronomy and the National Obſervatory were not forgotten. It is now undergoing a thorough repair, which it

much wanted; and it is to be ſupplied with inſtruments correſponding to the preſent perfection of ſcience.

When I firſt viſited the obſervatory, I found below, in a kind of roomy and well furniſhed cellar, a door open, and an old man ſittting at a table. Suppoſing him to be the porter, I enquired for Mechain, Delambre, and Bouvard. He told me, that Mechain and Delambre were gone to Perpignans, in order to meaſure a baſe line for determining a degree of the meridian. The ſuppoſed porter had papers before him, containing geometrical figures and algebraic calculations. I aſked him, If he amuſed himſelf with geometry and algebra? "Yes, in part," replied the venerable man, "but chiefly with aſtronomy. I was formerly aſtronomer of the obſervatory, but am now, as you ſee, thruſt down into this cellar." "Your name?" "*Jeaurat.*" "And I am Byggé, from Copenhagen, who highly eſteem you, and am well acquainted with your former labours." It gave me great

pleaſure

pleaſure to become acquainted with this worthy man, who calculated the *Connoiſſance des Temps* from 1776 to 1787. Jeaurat, who is the oldeſt of all the preſent aſtronomers of the Pariſian Obſervatory, eſtabliſhed and put in order a ſimilar erection at the military ſchool, and is the author of thirty eſſays in the Memoirs of the Academy. It happened to him, as to many more, during the revolution, to be ſupplanted by younger rivals of ſuperior intereſt, though not always better qualified. This aſtronomer, in his ſeventy-ſecond year, has nothing to live upon but the ſalary of the youngeſt member of the National Inſtitute, which is 1,200 francs, two ſmall apartments on the ground floor, and a little garden. I requeſted him to have the goodneſs to ſhew me the obſervatory; but he declined it, and deprived me of an opportunity of thanking him. I was then obliged to enquire who ſuperintended the obſervatory in the abſence of Mechain and Delambre? And was anſwered, Bouvard, ad-

aſtronomer, who lives in a ſmall ſeparate building belonging to the obſervatory, and where Mechain formerly reſided for twenty years. Bouvard again unluckily was not at home, and I was obliged to content myſelf with the *Citoyen Portier*, a follower of St. Criſpin, who, for the laſt eighteen months, had made ſhoes, waited at the obſervatory, and ſhewed it to ſtrangers, and I had great reaſon to be ſatisfied with his ſervice.

On the firſt floor, apartments are fitting up for Mechain, who lives at preſent in thoſe which Caſſini formerly occupied; and on the other ſide of the principal paſſage, Meſſier is to be accommodated in rooms, which are now under repair. There is, on the ſame floor, a ſpacious apartment for the uſe of the obſervatory, from which is an entrance to the ſide building, where tranſit inſtruments, and mural quadrants are ſet up, of which I ſhall give a more particular account. The whole obſervatory being at this time under repair, the inſtruments have been laid aſide wherever convenience

venience allowed. The following are in a lower apartment:—1. *A braſs equatorial inſtrument*, made by Haupoir, in 1792, for meaſuring the declination, having affixed on each ſide a circle of two and a half feet in diameter. It muſt be acknowledged that Haupoir is a good workman, as the diviſions appeared accurate, and the whole well finiſhed: but the inſtrument itſelf is by far too complex and troubleſome to be uſed in obſervations. 2. *A braſs quadrant*, by Haupoir, 1793, of eighteen inches radius, very well made: this is generally uſed for taking correſponding alitudes. The ſtand appeared to me to be very weak, and not ſufficiently ſteady. 3. An excellent aſtronomical time-piece, by Berthoud, with a pendulum to correct the errors ariſing from the influx of heat, which is in fact nothing more than Harriſon's gridiron pendulum. 4. A reflecting teleſcope of five feet, by Dollond. The ſtand is exceedingly ſteady and ſtrong; this teleſcope is ſet up like an equatorial inſtrument, in order to aſſiſt in obſervations

tions taken off the meridian. It is a thoroughly good inſtrument, executed in ſuch manner as might be expected from an Engliſh artiſt of Dollond's abilities. I requeſted leave to look through this teleſcope, which the porter granted me, with greater readineſs than I expected. I tried it on a very remote object, and found it exceedingly good. In this apartment are the buſts of Colbert, Jacob Caſſini, Dominic Caſſini and Maraldi, all of gypſum.

In a ſmaller apartment adjoining the large one above deſcribed, was a three foot quadrant, made by Langlois in the old French manner. This quadrant has over it a kind of moveable cap, or ſhade, and has been long uſed in taking correſponding altitudes. The French of late have begun to uſe the meridian circles, called by them *Inſtrument de Paſſages*, and which was invented by our countryman Roëmer, under the name of *Rota Meridiana*. This inſtrument has been uſed by the Engliſh ever ſince 1716, and termed by them a tranſit inſtrument.

inſtrument. De la Caille formed his catalogue of the fixed ſtars, by correſponding altitudes, all without the help of that inſtrument.

I next went into a room, intended for tranſit inſtruments, and mural quadrants, and which was under repair, the floor and ceiling not having been finiſhed.—We then went up into another floor, which is very lofty: the height, I ſhould ſuppoſe, might exceed twenty Daniſh ells. In the middle is a large room, on the floor of which is drawn a meridian line. It ſhould be obſerved that meridian lines were, at one time, in great vogue in France. I have found them drawn on floors at Verſailles, St. Cloud, Trianon, Chantilly, and many other places. There is nothing in this room but a large teleſcope of ſixteen feet focus, which formerly belonged to the King, and had been ſet up at Paſſy. Its metallic ſpecula have, by negligent treatment, loſt their poliſh, and are totally ſpoiled. At the bottom of the ſtand, is a large

large cog wheel, acted on by a pinion, by moving which the telescope can be shifted horizontally from one direction to another. From the centre of this wheel rises a strong axis, to support the telescope, to which is fixed a semicircle, which, by means of a pinion, raises or lowers the instrument; so that by this horizontal and vertical motion, the heavens can be swept at various altitudes. The tube of the telescope is metal painted blue with oil colors. Upon the whole, this instrument has but a mean appearance, and is of no value. Indeed it ought to be laid aside, unless the specula be newly polished.

On one side of this large room are two apartments, one of which is appointed to be the library of the observatory, and the other to be the residence of Delambre. On the opposite side is an apartment with windows in three directions, which contains the following instruments:—1. A reflecting telescope of six feet focus, by Hochon. The stand is of mahogany, made on the plan of Herschel's stand to his seven feet telescope: the

the ſpecula are of platina; but the porter could not let me examine them. 2. A parallax inſtrument carrying a glaſs of four feet focal diſtance. 3. Another on a larger ſcale, with a tube of ſix feet: they are both made on the common plan of the French parallax inſtruments. 4. An acromatic teleſcope of three feet, with triple object glaſſes, by Rochette. The ſtand is firm and good, and ſuch as Dollond or Nairne would have made for a teleſcope of the ſame dimenſions. The object aperture is three and a half inches. The porter aſſiſted me in directing this inſtrument towards ſome clear and diſtinct objects near Montmartre; but I found it d[illegible] and indiſtinct. There is, at the obſervatory of Copenhagen, an inſtrument of the ſame dimenſions as this, by Nairne and Blunt, and ſet up in the ſame manner; but it is far ſuperior to this inſtrument of Rochette. 3. A good aſtronomical time piece, by Berthoud, with a correction pendulum. 6. A ſmaller one,

or

or perhaps one of the ſame kind, but without the appendages.

On the other floor, which the ſingular ideas of Perrault, the architect, intended for the ſole purpoſe of an obſervatory, neither tranſit inſtruments, mural quadrants, nor ſextants, can be ſet up; ſo that the large and impotant aſtronomical inſtruments, which are moſt wanted in an obſervatory, are here totally uſeleſs. The floor underneath it is of no ſervice, except it be by fixing a teleſcope in one of the windows, in order to obſerve the eclipſes of the ſun, moon, and ſatellites of Jupiter, or the occultation of fixed ſtars by the moon; and then there is an inconvenience in taking down the time by ſome other chronometer, or by ſignals, according to which the moment of obſervation is to be determined; and the calculations for determining ſuch times are always ſubject to great uncertainties.

Whoever has ſeen, or been otherwiſe made acquainted with, the obſervatories of

Greenwich,

Greenwich, Oxford, Edinburgh,* Manheim, Gotha, and Copenhagen, will find that their arrangements, though much more ſimple, are alſo far more complete and commodious, for all kinds of aſtronomical obſervations, than this of Paris.

The porter, in the laſt place, conducted me up to the platform, where, on a fine clear day, one has an excellent view of this great city, ſo very remarkable, not only for its ſcientific, but its political hiſtory.

When I had ſatisfied myſelf with view-

* The learned author might have added the Obſervatory of Glaſgow, where Dr. Wilſon, who ſucceeded his learned and reſpectable father as Profeſſor of Practical Aſtronomy, has watched the motions of the heavens for many years. The ſtate of his health having lately obliged him to vacate his chair, he had the obſervatory and the inſtruments, ſome of which are very excellent, compleatly repaired, at his own expence. And he generouſly ſettled, on the inſtitution, £1000 payable at his death, the intereſt of which is to be applied to the progreſſive improvement of the aſtronomical apparatus.—*Tranſlator.*

ing

ing as much of the obſervatory as the porter could ſhew me, I gave him my card to deliver to Bouvard. The porter reading my name, cried out, "Ah! I know you very well—I am much ſurpriſed at it—this is an honour I could not have expected—ſtay a little, and I will convince you that I am right." He went into the library, and brought out different numbers of the "*Connoiſſance des Temps*," in which he ſhewed me ſeveral aſtronomical communications of mine to *Lalande* and *Mechain*. "You ſee now, ſaid he, that I am not miſtaken." I was rather ſtruck with this fantaſtical ſhoe maker, this door-keeper of the heavens, who ſeemed to be ſo familiarly acquainted with me, merely from his having read my name in an aſtronomical calendar. A few francs having ſatisfied him for his attention and trouble, we parted the beſt of friends; and he bawled after me, "Come again ſoon, I am always at your ſervice!"

LETTER

LETTER XI.

ACCOUNT OF THE NATIONAL OBSERVATORY CONTINUED.

A Time-piece, by Berthoud, goes well, as do twelve or fourteen by Arnold—Platina well purified, makes excellent ſpecula—Story of a Reflector of ſixty Feet, with platina ſpecula, a mere Rhodomontade—Inſtruments of De la Hire, &c. diſuſed, but preſerved—Obſervations interupted by the Revolution—Caſſini's large Lunar Chart, and Drawings of Lunar maculæ, recovered after being long loſt—His reduced Lunar Chart—The beſt is in Keill's Lectures, as improved by Lemonnier—Improvements in the Obſervatory—Le Noir's tranſit Inſtrument deſcribed—Mural Quadrants by Bird and Siſſon—Aſtronomical Sector, by Graham.

IT was not long till I reviſited the obſervatory, though the neareſt diſtance to it, from the place where I reſide, in *Rue Honoré*

Honoré, is half a Daniſh mile. After I had paid my reſpects to the father of the Pariſian aſtronomers, the aged Jeaurat, in his cellar, I enquired for Bouvard, whom I found at home. With all poſſible goodneſs and complaiſance, he ſhewed me the obſervatory, and ſuch curioſities as were inacceſſible to my aſtronomical ſhoemaker. Bouvard had in his apartment, 1, a ſilver watch, or chronometer, made by Berthoud, and which belonged to Borda. This had been on trial for fifteen months, and was found to keep time well: it coſt one hundred louis-d'ors.* I wiſhed to ſee whe-

* In juſtice to an artiſt whoſe merit ought to be better known than it is, I muſt obſerve, that excellent chronometers have long been made by Mr. Alexander Hare, of Greville-ſtreet, Hatton-garden, for leſs than half the price mentioned in the text. Mr. Hare has received letters from his employers in different parts of the world, expreſſing the higheſt ſatisfaction with thoſe productions of his ingenuity and experience. But ſuch is his modeſty, that his friends cannot prevail on him to make thoſe letters public, or, indeed, to take any other method to make his performances known; and of courſe this note is inſerted without his knowledge.—*Tranſlator.*

ther

ther it was of the ſame conſtruction as Arnold's chronometer, of which I have from twelve to fourteen upon trial at Copenhagen, and have found them all keep time excellently; but Bouvard could not inform me, as he was unacquainted with its internal ſtructure. I then deſired to have the piece opened, that I might ſee the conſtruction of it. But this again could not be done, as there was a cap ſcrewed down over the work. 2. Coulomb's declination compaſs: to prevent friction on the ſupporting pin, the needle, in this contrivance, is ſuſpended by a ſilk filament, as ſpun by the worm. The idea is altogether excellent, but ſtill it is not eaſy to make the centre of the circle deſcribed by the needle ſteadily coincide with the centre of the graduated circumference.

Beſides what I had before ſeen, and now re-examined, at the obſervatory, Bouvard ſhewed me, 1. the platina ſpecula of Kochon's teleſcope. The great ſpeculum was very good, yet there were here and

there

there ſome dark ſpeckles on the ſurface of it, which were undoubtedly owing to the platina not being perfectly purified before the ſpeculum was caſt; as it ſtill contained ſome ſmall quantity of iron. The little ſpeculum, however, was particularly excellent and clear, and of a beautiful poliſh; ſo that there are no doubts left, that excellent ſpecula for reflecting teleſcopes can be made of platina.

The frame which faſtens and ſupports the ſpeculum was of iron, forming a ſquare of two inches. In the corners of which were ſcrews faſtened, which, by preſſing on the back of the ſpeculum, kept it from falling by its own weight. But this muſt be done with great care; for the figure of the ſpeculum would be changed by much preſſure. Bouvard has now invented another contrivance for fixing the great ſpeculum, namely, by inclining it a little; ſo that the object is thrown to the other ſide of the farther part of the tube. He then took the leaſt or fartheſt ſpeculum away, and

and diſpoſed the image ſo as to be in a right line with the eye-glaſs. Herſchel has very properly made uſe of this method, in his large teleſcope of above twenty feet; and it can always be uſed to advantage in teleſcopes of a ſmaller ſize, in which the head of the obſerver intercepts ſo much light, that the image muſt neceſſarily be indiſtinct. 2, Bird's mural quadrant of eight feet radius, which formerly belonged to Le Monnier, and which will be an excellent inſtrument when ſet up on its wall, and properly adjuſted. 3, De la Hire's mural quadrant of five feet radius, all of iron. 4. The elder Caſſini's mural quadrant of the ſame metal, and of ſix feet radius, with a braſs adjuſter. It is divided by dots into ſpaces of five minutes, and the diviſions are taken by a micrometer, after the old method of the French aſtronomers. The two laſt inſtruments are not to be ſet up again, but are to be looked upon as venerable agents in the ſervice of aſtronomy; ſince it was with them that ſo many obſervations were made in the early part of the

preſent century. 5, Among the aſtronomical antiquities, are alſo to be ſeen eight or ten object glaſſes, of eight, ten, and twelve inches in diameter, and of ſixty, eighty, one hundred, and one hundred and twenty feet focus, by the Italian, Campani, who, at the cloſe of the laſt century, was as famous for his refracting teleſcopes, as Herſchel is at the preſent day for his large reflectors. I muſt here obſerve, that the optical and aſtronomical rhodomontade of a gigantic reflecting teleſcope of ſixty feet, with a platina ſpeculum, ſaid to have been made here, has no foundation, and has not been heard of, except in a German Gazette, and ſome other newſpapers. With the teleſcope of Campani, the Caſſini's, father and ſon, made many diſcoveries, ſuch as the ſatellites of Jupiter and Saturn,* the

* There appears to be ſome miſtake here. I apprehend the following to be the generally received hiſtory of the diſcovery of the Jovian and Saturnian ſatellites.—Simon Marius, aſtronomer to the Marquis of Brandenburg, diſcovered all the four ſatellites of Jupiter, in 1609, as he mentions in the preface to his *Mundus*

the maculæ of Venus, Mars, and Jupiter, and their rotations round their own axes, &c.

6, The

Mundus Jovialis, printed at Nuremberg in 1614. In the mean time, Galileo obſerved the ſame four ſatellites in 1610, and publiſhed his diſcovery the ſame year, in his *Nuncius Sidereus*. In 1655, Huygens diſcovered the fourth ſatellite of Saturn, and the firſt, ſecond, third, and fifth were diſcovered by Caſſini, from 1671 to 1684. Vide *Wolfii Elem. Aſtron.* (*in Element. Math. Univ.*) § 500, 519; *Diction. de Math. et de Phyſ. de Saverien art. Satellites*; *Heathcoti Hiſt. Aſtronomiæ*, *p.* 46, 81.

The learned Dr. Zach, however, aſtronomer to the Duke of Saxe Gotha, in his Ephemeris for 1788, has made it extremely probable, not to ſay abſolutely certain, that our great Harriot diſcovered the Jovian ſatellites at leaſt as early as Galileo, and that Harriot was equally early in the diſcovery of the ſolar *maculæ*, which were alſo obſerved by that celebrated Italian philoſopher. Harriot's obſervations on the Satellites were made from January 16th, 1610, to Feb. 26th, 1612; and thoſe on the maculæ, from Dec. 8th, 1610, to Jan. 18th, 1613. Dr. Zach's authorities are of a very cogent kind, being a large collection of Harriot's unpubliſhed papers, depoſited at the houſe of Lord Egremont, at Petworth, in Suſſex, and which the Doctor carefully reviewed in

6, The rough draught of the obſervations from the firſt eſtabliſhment of the obſervatory till the Revolution. A chaſm for ſome years ſucceeds; but now every thing is re-eſtabliſhed in good order, and the arrangement will be ſtill more complete, when the repairs are finiſhed

The obſervatory is now under the direction of the Board of Longitude, by whoſe order Bouvard made me a curious preſent, being a copy of the large chart of the moon, twenty inches in diameter, which Jacob and Dominic Caſſini cauſed to be engraved, after a ſeries of obſervations for nine years, viz. from 1671 to 1680.

The plate was loſt for about eight or ten years, but has been fortunately recovered and made public. In the national obſervatory has alſo been found a port-folio, con-

1784. In the ſame papers, he found convincing proofs that Dr. Wallis and others had ample reaſon to charge Deſcartes with having taken moſt of the *purely algebraical* improvements, to be found in his Geometry, from Harriot's *Artis analyticæ Praxis*.

Tranſlator.

ſifting of ſixty leaves, with original drawings by Le Clerc, one of the beſt draughtsmen of his age, of ſingular and diſtinguiſhed ſpots in the moon. The obſervations correſponding to thoſe drawings, and on which they were founded, are all of them in Caſſini's own hand-writing.

The preſent Caſſini, about the year 1788, reduced this large lunar chart to a diameter of eight inches, and had impreſſions of it taken in blue. I am poſſeſſed of one of thoſe impreſſions, which he ſent me to Copenhagen as a preſent. Both theſe lunar charts of Caſſini are much better reſemblances of the moon than that of Tobias Mayer, ſo much valued in Germany. The only thing I have to obſerve reſpecting this chart of Caſſini, is, that the ridge of mountains, proceeding in faint ſtreaks from the lunar macula, called Tycho, are not diſtinct or well defined. The lunar chart, which I look upon as the moſt accurate reſemblance of the full moon, is to be ſeen in *Inſtitutions Aſtronomiques*, Paris 1746,

p. 140. This book is merely a French tranſlation of *Keill's Aſtronomical Lectures*, with additions and improvements by the famous French aſtronomer Le Monnier.

I have before obſerved, that there is no mural quadrant erected in the building appropriated for obſervations; nor indeed does it contain any inſtrument of this kind, which I can much commend. The obſervatory is at this time receiving great improvements, and will be put into a proper ſtate of repair. For this purpoſe, it has been found requiſite to build a ſolid wall to the ſame height as the lower floor of the obſervatory, and to erect a ſide building on this baſis, for the reception of the inſtruments above mentioned. This laſt, though it appear to be only a protuberance on the great body of the edifice, is to be the proper and real obſervatory.

In this ſide building are three apartments:

1, One for an obſerver, in which there is a fire-place.

2, An

2, An apartment for a tranſit inſtrument.

Though this inſtrument is not yet brought to the obſervatory, I ſhall offer a deſcription of it, having been often permitted to ſee it by that ſkilful inſtrument maker, Le Noir. The achromatic tube is five feet in length, and has a very large aperture. The two movements, one for raiſing and depreſſing the axis, and the other for bringing the inſtrument to coincide with the meridian are very good. The extremities of the axis are of bell-metal, and ſet in triangular plates. A counterpoiſe balances a part of the weight of the tube. The level is excellent, and can be very conveniently fixed up, and adjuſted. Theſe are entirely new improvements. I have an inſtrument at the obſervatory of Copenhagen, in conſtructing which, the ſame general principles have been obſerved. See *Obſervationes Aſtronomicæ Hafnienſes*, 1783 *et* 1784. In the teleſcope are five vertical threads, and on this account the eye glaſs

is made moveable, and can be fixed before any of the threads, ſo as to prevent the line of viſion from being bent or indirect. In the year 1777, I ſaw a tranſit inſtrument at Greenwich, adjuſted in the ſame manner. The only thing which appeared to me to claim the merit of novelty, in the Pariſian inſtrument, was the manner of illumination. A and D (Fig. 2.) are bell-metal gudgeons on the axis A B C D. E F is a teleſcope, the object-glaſs being oppoſite to E, and the eye-glaſs facing F. At D is an aperture within the axis, half an inch in diameter. and at an angle of 45°, is fixed a metal plate G H, in the middle of which is a circular aperture I, in a line with the axis E F. M is a lamp, in a glaſs lanthorn, to prevent the wind from blowing it out, in the time of obſervation, or at leaſt to keep the flame from agitation, which would make the light changeable and unequal. The light produced by this lamp falls through the aperture D on the plate G H, by which it is reflected in the direction I F,

towards

towards the threads and eye-glaſs at F, and thus the whole field of the teleſcope becomes enlightened. This illumination ſhould be greater for the larger and clearer planets and ſtars, and leſs for thoſe of an inferior magnitude and luſtre, which, by a ſtrong light, would become indiſtinct. To effect this, Le Noir has introduced a triangular priſm of green glaſs, reſting on one arm of a lever, the other arm of which is placed towards the obſerver, and is ſo long, that he can lay hold of it, and thereby raiſe or lower the priſm. When the priſm N P is ſo depreſſed, that the thick part towards N comes between the lamp M and the aperture D, a number of rays are loſt, and the light becomes weaker, and calculated for the more obſcure ſtars. On the ſame principle, if the priſm be raiſed higher, the rays will have to paſs through a thin body of glaſs, and the illumination will be ſtronger, and adapted to the larger and more luminous celeſtial objects. The darkneſs of the glaſs, and the intervening

dimenſions of the priſm, muſt be determined by experience. This priſm was made of light green glaſs, like the common glaſs for ſpectacles. The depth NP of the priſm was four inches, and its greateſt thickneſs at N ſomewhat more than an inch. This diſpoſition is undoubtedly well contrived, as well as ſafe and accurate in practice. The common method, however, uſed at the obſervatories of Greenwich, Oxford, and Copenhagen, by an illumination plate, without the teleſcope, which throws the light in through the object-glaſs, and can be eaſily fixed, ſo as to caſt a greater or leſs quantity of light, is equally good. A deſcription and drawing of this method may be ſeen in my *Obſervationes Hafnienſes*, 1781, 1784, Introduct. c. 2. ſect. 18. In the Engliſh and Daniſh method of illumination, the glaſs is cloſed and ſhut up; ſo that not an atom can enter into it from without: on the contrary, in this French method, the duſt enters through the aperture D, falls on the illuminating plate GH,

and

and through I, it proceeds to the threads, and to the object and eye-glaſſes.

The fine particles of matter, floating in the air, are more numerous than is generally ſuppoſed by thoſe, who have not had an opportunity of making obſervations on this ſubject. Theſe particles will render the thread thick and uneven, and the glaſs dull; ſo that annually, or biennially, the inſtrument muſt be taken to pieces, and the glaſſes and thread cleaned. The inconvenience of having the inſtrument to ſet up again and adjuſt, muſt be a great obſtruction, in conducting a ſeries of obſervations, which require an inſtrument to be in a perfectly invariable condition. But, though theſe defects are not to be denied, this tranſit inſtrument is well executed, and will be found a very fine one, when ſet up on its proper pillars, which Bouvard told me, are to be of granite.

3d, The third apartment in the ſide-building is intended for a mural quadrant. In the middle of this apartment, a wall is

now building, of the common calcareous ſtone, generally uſed at Paris. When this wall is completed, a mural quadrant of eight feet radius, by Bird, will be ſuſpended on its left ſide. The limb of this quadrant has a two-fold diviſion, namely, into ninety and ninety-ſix degrees; and is conſtructed in the manner deſcribed by Bird, in his "Method of conſtructing mural quadrants, London, 1768;" and on the ſame plan with the Copenhagen mural quadrant, of ſix Daniſh feet radius.* See *Obſerv. Aſtron. Hafniens. Introduct.* p. 54. On the right ſide of this wall, a mural quadrant of five feet radius by Siſſon, is to be ſuſpended. This was not in the obſervatory; but under repair at Le Noir's, where I ſaw it. The inſtrument on the whole was good, but of an old conſtruction, and more weakly joined than the quadrant of Bird.

Thus is this little building (the moſt important part of this coloſſal National Obſervatory) provided for the uſe of ſome of

* Nearly five feet nine and a half inches Engliſh. —*Tranſlator.*

the

the moſt able and eminent aſtronomers of Europe, Meſſier, Delambre, and Mechain. Bouvard, the adjunct, who laſt year diſcovered a comet, will moſt certainly contribute his ſhare towards making a proper uſe of thoſe inſtruments. Mechain and Bouvard, who alone live at the obſervatory, make the obſervations, and record them in very exact and well arranged protocols. Meſſier and Delambre told me, that not being inclined to change their abodes, they have each of them a ſmall obſervatory at their own houſes. All the four gentlemen are as kind and obliging as they are eminent for their obſervations and mathematical abilities.

It gave me great pleaſure to become perſonally acquainted with C. Mechain, after his return from meaſuring degrees of the meridian, in executing which, he inſtituted a ſeries of triangles from Barcelona to Rodés, and, with unwearied induſtry, aſcertained the height of the pole at different places, ſituated nearly on the meridian

of

of Paris. Ever ſince 1781, I have kept up a regular aſtronomical correſpondence with him, Lalande, and Caſſini, who, before the Revolution, was Comte de Thury, and director of the obſervatory.

I obſerved that there was one inſtrument wanting at the national obſervatory, namely, an aſtronomical ſector of ten or twelve feet radius. Lalande gave me to underſtand, that there is at Paris an excellent inſtrument of this kind, being a twelve foot ſector by Graham, uſed by Maupertius in meaſuring a degree of the meridian, and that this famous inſtrument will be brought to the obſervatory.

LETTER

LETTER XII.

NATIONAL OBSERVATORY CONTINUED—OBSERVATORIES OF THE MILITARY SCHOOL, OF THE FRENCH COLLEGE, AND OF PRIVATE PERSONS.

Inſtruments for aſcertaining the magnetical Variation—Caves of the Obſervatory deſcribed—Magnetical Variation and Temperature in them—Searched for Arms and Ariſtocrats—Obſervatory advertiſed for Sale—Caſſini driven from it, and now in poor Circumſtances—Platina ſpecula by Carroché—His excellent Achromatic—Pillars for the tranſit Inſtrument too low—Wall of the Mural Quadrant ſpoiled by the capricious Builder—Mechain's Aſtronomical Labours—Bouvard's Compariſon of Arabian Obſervations with later ones—Defective organization of the National Obſervatory—Telegraphs in Paris—Obſervatories

ſervatories at the Military School, and the French College—Lalande's Merits not ſufficiently acknowledged—Obſervatories of Meſſier and Delambre.

ON the 10th Brumaire, 6th year, or 31ſt of October, 1798, I was at the obſervatory, in company with Profeſſor van Swinden, and Æpinea, director of navigation, both from Holland, and Profeſſor Tralles from Swiſſerland, who, like myſelf, were foreign Commiſſioners for weights and meaſures. Caſſini met us there by appointment, in order to ſhew us the inſtruments he had conſtructed, and the methods he uſed for aſcertaining the variation of the compaſs. Before the principal door of the obſervatory, on a terrace, at the end of Mechain's garden, the inſtruments of Coulomb and Caſſini were erected on a round pedeſtal of ſtone, on which a horizontal meridian line was drawn, a vertical ſection having been alſo raiſed on the whole height of the building.

Caſſini's

Caſſini's inſtrument is a circle of ten inches in diameter, furniſhed with a needle of the ſame length, ſuſpended by a ſilk filament, after the method of Coulomb, and a Nonius at each end points out ſingle minutes. Over the center is fixed a vertical ſtand to receive a ſmall tranſit inſtrument with its level, the line of viſion of its teleſcope being made to correſpond with the diameter of the inſtrument at Zero.

The principal diameter of the inſtrument can be ſet to the meridian by the teleſcope, and the above mentioned vertical line, on the wall of the obſervatory, and by a mark on a wall on the other ſide of the inſtrument; and its ſuperficies can be fixed horizontally by two ſcrews below the circle. The angle of variation can be thus found, either directly or by doubling it, as with the circle of Borda, in order to obtain the minutes ſtill more accurately. With this inſtrument of Caſſini, the variation was obſerved on the 31ſt of October, 1798, by the following gentlemen:

By

By Bouvard	—	22° 13′
Tralles	—	22° 11′
Van Swinden	—	22° 11′
Byggé	—	22° 11′
Mean variation of the needle - - -		22° 11′ 45″

C. Coulomb's inſtrument has a needle of twenty-four inches in length, and three-fourths of an inch in breadth, ſuſpended by a ſmall wire. It is not a perfect circle, but has at both ends an arch of about thirty degrees, divided by tangents, and over each of the arches is a microſcope. It was unanimouſly agreed, that there was ſome eccentricity, and that the needle was accurately ſuſpended. Bouvard, with this inſtrument, obſerved the variation to be 22° 12′; ſo that with both inſtruments the obſervations agree very well. Laſtly, with a variation inſtrument, of a conſtruction ſimilar to that of mine at Copenhagen, and which the meteorological ſociety at Manheim

heim had given to the celebrated *Le Cotte*, the variation was obſerved to be 22° 24′, and the exceſs of twelve minutes might very well be accounted for from an error of the ſiderial paralleliſm with the meridional line, which is properly owing to the ſudden friction of the agate on the ſteel. The juſtneſs of the well known preference of Coulomb's method of ſuſpenſion to the common one, appeared on this occaſion very evident.

Caſſini went down with us to the caves of the obſervatory, which are very remarkable. The deſcent is by one hundred ſteps, to the depth of forty feet beneath the ſurface of the earth. The caves particularly conſiſt of ſeveral labyrinth paſſages of four feet in width, and five or ſix in height. In moſt places thoſe ſubterraneous paſſages are walled; but in ſeveral the natural ſtone or rock forms the ceiling, in ſome places the ſides, and in others the floor. Theſe caves are in general very dry, but in ſome places, either the ceiling or the floor are moiſt.

moiſt. In ſeveral parts of the ceiling, drops are cryſtallized into ſtone and ſtalactites, and the moiſture on the floor is covered with a ſtony ſcum or membrane. I have ſeen at Stevens's Cliff, in Zealand, the water, iſſuing in this manner out of a chalk rock, form a concretion, which ſeemed to be flint covering ſoft chalk.

When Caſſini was director of the obſervatory, he cauſed two apartments to be conſtructed, and ſeparated from the labyrinth by a wall: one of theſe apartments was deſigned for obſerving the variation of the compaſs under ground. In the years 1783 and 1784, Caſſini found no ſenſible difference between the variation above and under ground. See *De la Declinaiſon et des Variations de l'aiguille aimantée, par Caſſini, à Paris*, 1791, *p.* 24.

In the other apartment was a Reaumur's thermometer, made by Borry, under the direction of Lavoiſier.

Every degree of this thermometer was four inches three lines. Caſſini made obſervations

ſervations by it for three years, and found that the temperature of the earth, or heat of the air under ground, did not undergo a greater change than three tenths of a degree.

Theſe labyrinth caves and large paſſages under ground, lead to a grate or iron-doors from which there was, in ancient times, a communication with the quarries: but no man knows how far, or in what preciſe direction, this paſſage extends. This grate was ſet up when the obſervatory was firſt built. In taking notice of it, Caſſini related to us ſome of his hiſtory in the time of the Revolution, when his going regularly every day down to theſe caves, in order to obſerve the magnetic needle and thermometer, gave riſe to a rumour among the then ruling jacobins and ſans-culottes, and which, as uſual, acquired in its propagation, conſiderable alterations and additions. It was, in ſhort, concluded, that proviſions, arms, ammunition, and ariſtocrats were concealed in the caves of the obſervatory.

obſervatory. One morning Caſſini was very early taken out of his bed, by three or four hundred jacobins and ſans-culottes, armed with firelocks, ſwords, pikes, and cudgels, and forced half-naked to conduct them down to the caves of the obſervatory, in order to examine thoſe ſubterraneous receſſes. Caſſini told them that he obeyed them the more willingly, as he was certain the caves contained none of thoſe articles which they expected to find in them; yet he muſt tell them before-hand, that the caves of the obſervatory led to a faſtened iron-door or grate, which opened into a hitherto unexplored ſubterraneous paſſage, which, for aught he knew, might communicate with places in the city; that he was totally unacquainted with thoſe paſſages, and of courſe could not be anſwerable for what might be found in them. Not half dreſſed, and ſurrounded with bayonets, ſwords and pikes, he was obliged to conduct them through all the caves, and the inextricable windings and meanders

of

of thoſe caves; and this brave band found them, as Caſſini had predicted, totally empty. They finally approached the iron-door, which they found had been forced open, probably by ſome maſons and ſmiths belonging to the troop, while the reſt went in queſt of Caſſini. They demanded that he ſhould conduct them down into the ſubterraneous paſſages in the rock: but he reminded them of what he had before ſaid; adding, that he was perfectly in their power, but that he had rather ſuffer death on the ſpot, than conduct them down into thoſe unknown paſſages, for which he neither would nor could be anſwerable, and that he coolly waited for their deciſion, even if his death ſhould enſue. The moſt important among this corps then held a council of war, the reſult of which was, that Caſſini, guarded by ſix men armed with pikes, ſhould return to his apartments, and that the reſt ſhould go down into the paſſage or cavern. After they had proceeded a good way in, and found nothing,

thing, they became tired, returned back again, and ſpared the obſervatory for that time. But that edifice has ſince been often ſearched, and the inſtruments, aſtronomical conſtructions and apartments of the aſtronomers very much injured by ſuch viſitations.

C. Bouvard, though a ſtaunch and zealous republican, told me, that thoſe vandals once took it into their heads to ſell the obſervatory, and actually wrote, in large characters, over the door,

PROPRIÉTÉ NATIONALE A VENDRE.*

The Caſſini, whom I have ſo often mentioned, began, in 1784, to improve the obſervatory, to procure new and ſuperior inſtruments, and to conduct the obſervations on a better and more accurate plan. He publiſhed yearly, from 1785 till 1791, a number or volume of his aſtronomical obſervations, on the fixed ſtars, ſun, moon and planets, calculated and compared with

* National property to ſell.

the

the beſt aſtronomical tables, in order to aſcertain and correct the errors of thoſe tables. He ſent thoſe numbers annually to other aſtronomers, and he had the goodneſs not to forget me. He did every thing, in ſhort, that could be reaſonably expected from an able, induſtrious, and experienced aſtronomer.

In the midſt of Caſſini's celebrated career, the revolution took place. Having been ſuſpected by the terroriſts, he was driven from the obſervatory, which he had ſo honourably conducted, and not only deprived of his office and income, but confined in priſon above a year; and he has ſaved nothing but his life, and a ſmall property, which he inherited from his anceſtors, where this worthy man, with his numerous family, exiſts upon a ſcanty income. In the opinion of ſome people, the ambition, envy, and egotiſm of certain other aſtronomers, have greatly contributed to drive both Caſſini and Jeaurat from the obſervatory.

Among other contrivances, Caſſini had a foundery built for caſting the large aſtronomical inſtruments, which he intended to have had conſtructed for the obſervatory. This foundery, when France was filled with manufactories of ſalt-petre, powder, and fire-arms, was converted into a cannon foundery. As relics of that direful and alarming period, eight cannons, twelve pounders, ſtill remain there. But the times are now ſo much changed for the better, that the votaries of the beautiful and pacific Urania have now nothing to fear from theſe diſpenſers of the thunder of Mars; eſpecially as they are not charged, or ſo much as furniſhed with touch-holes.

The beſt French optician is the able Carroché, of whom I ſhall on another occaſion give a fuller account. Carroché is the only man who has caſt and ground ſpecula of platina, which he did for what is called the Hochon teleſcope, of ſix feet. He had the goodneſs to go with me to the obſervatory, and to ſhew me the effect of this teleſcope,

ſcope, and of one of his newly ground ſix foot achromatics, belonging to Borda. The object glaſs conſiſts of a crown and a flint glaſs, between which is a maſtic effuſion (*Maſtic en larmes*). The aperture of theſe conglutinated object glaſſes, called by the French *collés*, is ſomewhat more than five inches.

The reflector and achromatic were ſucceſſively directed towards a piece of paper fixed at the diſtance of four or five hundred toiſes. This could be very evidently diſtinguiſhed by both the inſtruments; but with this difference, that the reflector not only magnified much leſs, but gave a remarkably brown reflection, and an obſcure and confuſed image: and the teleſcopes made with the general compoſition are found to caſt a reflection more or leſs yellow. Carroche's achromatic not only magnifies much more, but has at the ſame time very great clearneſs. The paper has its true, and perfectly white colour.

On the laſt day of January 1799, I paid my final viſit to the obſervatory, partly with a view to take my leave of Mechain, Jeaurat, and Bouvard, and partly to ſee how far they had proceeded with the apartments intended for the tranſit inſtrument and mural quadrant. The apartment for the former was completed, except that the pillars, or pyramidic *fruſta*, deſigned to ſupport the axis of the inſtrument, were not finiſhed. Bouvard had told me, that they were to be made of granite; but, when I approached to view them more minutely, I found that they were too low, and were to be heightened with a piece of marble. Of this joining I by no means approved, and endeavoured to perſuade my aſtronomical friends to have the pillars made of one piece of marble, or ſome other hard ſtone. The ſtone floor of this apartment had been laid the preceding ſummer; ſo that holes were now to be made in it, to receive the pillars. It would have been

more

more proper either to have had the pillars in readineſs to be fixed when the floor was laid, or elſe to have deferred the laying of the floor till the pillars could have been provided.

The apartment for the mural quadrant was alſo ready, and the *murus*, or wall, was built. But this wall has three defects. 1. It is not broad enough at top; ſo that a part of the quadrant, from 0 to 30° in height, is without the wall; nor is it ſufficiently ſupported. 2. The pivots, by which the quadrant is to be hung, are fixed ſo low, that the nethermoſt edge of the inſtrument would not be a foot from the floor. On this account, no object at a great altitude could be obſerved; for it would be impoſſible for the obſerver to put his head between the floor and the eye-glaſs, or at leaſt to keep himſelf in a ſteady poſition, which, in all obſervations, is a moſt important circumſtance. 3. The wall is built ſo much forward, that the teleſcope of the quadrant does not anſwer to the narrow

aperture in the ſide wall of the apartment; ſo that one cannot ſee through the teleſcope, as it is fixed on this clumſy wall. The conſequences are, that, beſides building the whole wall over again, it muſt be made broader; the two pivots of the quadrant muſt be fixed at leaſt two feet higher, which cannot be done without taking away the two uppermoſt courſes of hewn ſtones, and ſubſtituting others much higher: and laſtly the aperture through which one looks, in uſing the inſtruments, muſt be made wider. Broad or wide apertures are, in every reſpect, more convenient than ſmall ones.

The aſtronomers of the National Obſervatory complained of the obſtinacy and caprice of the builder, which obliged them to have the wall of the mural quadrant altered.

I have already ſaid, that the aſtronomers of the National Obſervatory are Meſſier, Delambre, Mechain, and Bouvard; that Meſſier and Delambre do not reſide at the obſervatory, and that Mechain is an able, induſtrious

induſtrious, and excellent man, and has laboured in the obſervatory for thirty years. In the years 1786 and 1787, he meaſured part of the longitudinal arch, in order to unite the obſervatories of Greenwich and Paris. See "*Expoſition des Opérations faites en France, pour la Jonction des Obſervatoires de Paris et de Greenwich, par M. M. Caſſini, Mechain, et le Gendre, Paris,* 1796." From 1792 to 1798, Mechain has been occupied in meaſuring a meridional arch, from Barcelona to Rodés. He has compleated this meaſurement, and the concomitant obſervations on the height of the pole, with all the accuracy to be expected from ſo able a man. Beſides the place he holds at the Obſervatory, Mechain is Hydrographic Aſtronomer to the "*Depôt de Marine*," or The Marine Depoſitory: and has collected and calculated, with incredible induſtry, ſuch obſervations as contribute to determine the extent of harbours and ſea-coaſts. From a correſpondence of twenty years, which he has held with me, I can bear teſtimony to the

induſtry he has applied to the northern coaſts. Mechain poſſeſſes, and deſerves the regard and confidence of the Marine Miniſter, Bruix, and of Vice-Admiral Roſſilly, who preſide over the Depoſitory. This deſerving man, however, is not without his opponents, and I have heard ſome perſons take great pleaſure in reviling his character.

Bouvard, who came to the obſervatory ſince the revolution, is a very induſtrious and ſkilful aſtronomer. He always calculates his obſervations, and compares them with the beſt aſtronomical tables. The obſervations of the Arabians were collected by Iben Junis, whoſe principal manuſcript is in the library at Leyden. Joſeph de l'Iſle, who formed an extenſive collection of aſtronomical manuſcripts, had a copy of it, which Meſſier received from him. This is now tranſlated, and Bouvard has calculated out of it, and compared with our modern tables, twenty-ſix eclipſes of the ſun and moon, obſerved by the Arabians from

the

the year 829 to 1004; twelve ſolſtices; and ſeveral occultations of the planets; and one of Regulus, or α in Leo, by the intervention of the moon. He has found that the mean longitude and anomaly of the moon muſt have decreaſed eight minutes, and that the place of her node has decreaſed two or three minutes. He has alſo found, that the Arabians were well acquainted with the menſuration and true length of the year, to within about five ſeconds of the truth.

The National Obſervatory is now in good condition, and provided with excellent inſtruments, for the common uſe of the four eſtabliſhed aſtronomers, Meſſier, Delambre, Mechain and Bouvard. In the preſent organization of the obſervatory, no one of the aſtronomers is ſubject to another; but all the four are under the control of the Board of Longitude. It is poſſible that this organization may have its advantages; but it may alſo be attended with inconveniences. As long as perfect harmony

and a good underſtanding ſubſiſt among the aſtronomers, every thing will go on well. But unanimity is not always to be found in this ſublunary world of our's, and the interruption of it might be attended with ſeveral difficulties. For inſtance, A undertakes a ſeries of obſervations, which require that the inſtruments ſhould neither be moved nor altered. B obſerves with the ſame inſtruments, and unacquainted, perhaps, with the deſigns of A, he finds that the tranſit-inſtrument, or the mural-quadrant, requires an adjuſtment only of a few ſeconds. He alters the inſtrument accordingly, and thus renders A's courſe of obſervations uſeleſs. Would not confuſion enſue, if all the four co-ordinate aſtronomers ſhould wiſh to obſerve at once, one and the ſame phænomenon; as, for inſtance, a planet's oppoſition to the ſun, entrance into its node, its aphelion, the inclination of its orbit, &c.? Would it not be better, therefore, to have this obſervatory organized like all the other eſtabliſhments of the kind in Europe,

rope, where there is one principal aſtronomer, and the reſt aſſiſt, and labour under his direction? But if each aſtronomer had the command of a ſeparate ſet of inſtruments, the preſent regulations of the French National Obſervatory, would undoubtedly deſerve the preference.

On the platform are two ſmall chambers for the accommodation of thoſe who attend the telegraph there erected. In ſummer, ſeveral trials were made there, with flag ſignals; but I am not acquainted with the object, or the ſucceſs, of thoſe trials; nor could the aſtronomers at the obſervatory give me any information concerning them. I ſhould ſuppoſe that there can be no better conſtruction of telegraphs than that with one principal pole, and two arms moveable at the ends; and ſuch is the conſtruction of the telegraph at the houſe of the Marine Miniſter, on the corner of the *Place de la Revolution*, and *Rue St. Florentin*; of that at the *Garde-meuble*, which conveys ſignals to Breſt; of that on the Louvre, to Liſle;

and of that on the church of St. Sulpicius, to Straſburg; and theſe are the only telegraphs at this time in Paris.

I now proceed to the inferior obſervatories at Paris, which are to be conſidered either as public or private: the public are thoſe of the Military School and French College, and the private ones are at the houſes of Meſſier and Delambre.

The obſervatory at the Military School was put in order by Jeaurat, and Lalande has ſince had it under his direction. It is on the third floor of one of the wings of the Military School. The walls whereon the obſervatory and inſtruments reſt are entirely ſolid, all the way up, and carefully overlaid; ſo that nothing has been neglected to enſure every poſſibly degree of ſteadineſs. The inſtruments are, 1, An excellent eight-foot quadrant, by Bird. 2. A very fine four-foot tranſit inſtrument, by Lenoir, conſtructed entirely like the meridian teleſcope, at the National Obſervatory, which has been already deſcribed.

The

The place on which it is fixed is but juſt large enough, and I am rather afraid, that this ſituation on a high corner wall is not the beſt; becauſe the rays of the ſun produce, on this account, more violent changes of heat and cold. Here are alſo a time-piece, a ſmaller quadrant, and ſeveral teleſcopes. Lalande has ſeveral apartments at this obſervatory, though he reſides at the French College. At this obſervatory, which is very well conſtructed, that aſtronomer and his nephew obſerve the many thouſand ſtars, which are moſt of them teleſcopic, or inviſible to the naked eye.

The obſervatory at the French College, is on the third floor, and contains, 1, A ſmall tranſit inſtrument of three feet, which is not well fixed. 2, A common French quadrant of three feet radius, with a moveable ſhade over it, intended for taking correſpondent altitudes. 3, A four-foot ſector. 4, Several time-pieces and teleſcopes. 5, Borda's circle of eighteen inches in diameter, by Lenoir, which, in my opinion,

is

is the beſt inſtrument in this obſervatory. There are alſo ſeveral other leſs important and older inſtruments.

The obſervatory at the French College, as well as that at the Military School, is under the inſpection of Lalande. This learned man is the Ptolemy of our age; for, as the Almageſt of that old author contains a complete body of ancient aſtronomical knowledge; ſo Lalande's aſtronomy is a complete and excellent depoſitory of the modern improvements in that ſcience. He is a man of very extenſive reading, is well acquainted with all the aſtronomical writers, and poſſeſſes great literary knowledge, qualifications not altogether common, even in France. He has greatly improved the aſtronomical tables, by determining and calculating their firſt principles, from the beſt modern obſervations. In conjunction with his pupil, and intimate friend, Delambre, he has calculated new tables of the planets, which are inſerted in the lateſt edition of his aſtronomy, and are the beſt tables

bles of the kind extant. Lalande has a very extenſive correſpondence with all the aſtronomers in Europe, who have laboured to promote his favourite ſcience. But it is admitted that he has loſt ſome of his reputation in Paris, and that ſufficient juſtice is not done to his merit.

Meſſier, ſo celebrated for the many comets he has diſcovered, lives at *Rue des Mathurins*, *Maiſon de Clugny*, No. 334, and has, on the upper floor, a ſmall obſervatory, containing an accurate meridian line, a time-piece, a quadrant, and a parallactic machine, wherewith he has diſcovered and traced his comets. This worthy old man is very lively and chearful, as I have experienced in the many agreeable hours I have paſſed in his company. Apartments have been prepared for him at the National Obſervatory; but his age, and the convenience he finds in his preſent ſituation, and in the uſe of his own inſtruments, ſufficiently account for his continuing in his old abode.

Delambre,

Delambre, one of the beſt and greateſt aſtronomers of France, lives in *Rue de Paradis au Marais*, No. 1, where he has a neat little obſervatory, with a ſmall tranſit inſtrument, a good time-piece, which formerly belonged to *De la Caille*, the two circles, which Borda uſed in meaſuring a degree of the meridian in France, and ſeveral good teleſcopes. From a ſeries of more than eight hundred obſervations, on different circumpolar ſtars, with the largeſt of Borda's circles, he has this winter determined the polar altitude, at his obſervatory, to within a ſecond, or at leaſt as nearly as the truth can be approached with inſtruments of fifteen or eighteen inches in diameter. Delambre told me, that, when he transferred the latitudes of his own obſervatory to the National Obſervatory, allowing for the known difference in latitude, aſcertained by the meaſure of the meridian, he found the latitude of the National Obſervatory to be what Lalande had made it.

it. I muſt, however, obſerve, that owing to uncertainty of refraction, even when Bradley's table is uſed, as being the moſt accurate, an uncertainty of a ſecond in latitude may ſtill remain.

LETTER

LETTER XIII.

THE BOARD OF LONGITUDE, THE BOARD OF GEOGRAPHY, THE NATIONAL LIBRARY, AND THE LIBRARIES OF THE ARSENAL AND THE PANTHEON.

The Bureau des Longitudes, *inſtituted in Imitation of the Britiſh Board of Longitude, but with ampler Powers—Of whom compoſed—Fleurieu's large Marine Atlas—Buſineſs of the Board of Geography—Excellent Mathematical Tables—The War deprives France of Men and Money—Large Maps of France and Denmark—Caſſini ſuſpected, and his Maps, &c. locked up—National Library and its Regulations—Pair of Globes thirty Feet in Diameter, an uſeleſs aſtronomical Luxury—M.S. Letters of Colbert, &c—Prints—Antiques—Egyptian Curioſities—Shields of Scipio and Hannibal—*

nibal—Intaglios—Antiquities deſpiſed in France—Schools for Oriental Languages —Libraries of the Arſenal and Pantheon —Libraries, Paintings, &c. of thoſe baniſhed, &c. partly deſtroyed, partly formed into new Collections.

EXPERIENCE has proved, that the Board of Longitude in London has been productive of much good. That laudable inſtitution has been imitated here, and the *Bureau des Longitudes* was eſtabliſhed by a decree of the 7th Meſſidor in the 3d year. But this Bureau is on a more extenſive ſcale, and endowed with greater authority than the Board of Longitude in England. The *Bureau des Longitudes* has under its inſpection the National Obſervatory at Paris, and the one at the Military School, together with all the aſtronomical inſtruments belonging to the nation. It gives orders for the neceſſary regulations which take place at both the obſervatories; and appoints and pays aſtronomers and attendants.

tendants. It employs itſelf in improving the aſtronomical tables, and the methods of determining the longitude, both by ſea and land; in publiſhing the aſtronomical and meteorological obſervations; in calculating the *Connoiſſance des Temps*, which is publiſhed two years in advance, in order that the French navigators, when, on long voyages, they would determine the longitude, from the calculated diſtance of the moon from the ſun or the ſtars, may be under no embarraſſment. This, however, cannot happen at the preſent period; as the French have neither trade nor navigation. Privateers never proceed ſo far as to make the calculation of longitude neceſſary; for they take the firſt veſſel they meet, whether ſhe belong to friends or foes. The members of the Commiſſion are men of the greateſt celebrity: *Geometricians*, Lagrange and Laplace; *Aſtronomers*, Lalande, Meſſier, Mechain, and Delambre; *Navigators*, Borda and Fleurieu; *Geographer*, Buache; *Artiſt*, Carroché; *Adjunct Aſtronomers*, François

çois Lalande and Bouvard. Theſe commiſſioners meet regularly, once in every decade, and oftener when circumſtances require it, in one of the ſmaller apartments of the National Inſtitute.

Of all theſe members of the Board of Longitude, I have either already given an account, or intend doing it more fully in the next letter. What relates to Fleurieu, I ſhall mention in this place. He was formerly an officer in the navy, and, ſince the revolution, was, for ſome time, Miniſter of the Marine. Among many other voyages, he made one in the year 1769, on board the frigate Iris, in order to make a trial of two of Berthoud's ſea time-pieces. He has publiſhed an account of this voyage, in the courſe of which, he determined the longitudes and latitudes of many harbours and coaſts, more accurately than had been before done. He has beſtowed much labour on the improvement of ſea charts in general, but more particularly on thoſe of the ſea of Kamtſchatka, and of the Baltic and eaſtern

eaſtern ſeas. He ſhewed me a large and beautiful atlas of the above voyage, and which conſiſted of about one hundred and thirty charts, extremely well engraved. At the ſame time, he ſhewed me a quarto volume, already printed, conſiſting of about three ſeries of alphabets, and containing the aſtronomical, geographical, and nautical obſervations, by which the ſituations of the coaſts were determined. He not only made thoſe obſervations, but calculated them throughout, or had them calculated by others, on the ſame plan in which Mechain calculated the great Swediſh and Daniſh triangles, and deduced therefrom the latitudes and longitudes. He found it neceſſary to correct, alter, and improve ſeveral things in the Swediſh calculations, but none in the Daniſh, having found all the longitudes and latitudes ſuch as I calculated, and partly publiſhed, them. The printing both of the charts and text of this important work, was begun in times of monarchy. Since the revolution, it has been

been ſuſpended for want of ſupport. The Directory have promiſed, however, that the printing of it ſhall be reſumed, as ſoon as money and opportunity will admit. It would be a great loſs to the ſciences, if this elegant and uſeful work, which has coſt Fleurieu ſo much time and labour, ſhould be laid aſide unfiniſhed.

The Board of Geography (*Bureau du Cadaſtre*) is a very good inſtitution, and under the ſuperintendance of the excellent Prony. The geographers employed by this Board are all taken from the geographical ſchool, and are therefore well acquainted with theory, and highly capable of performing all the menſurations and calculations relating to their department. Under the ſuperintendance of this Board, are executed geographical and topographical admeaſurements and deſcriptions of the territories of the republic; geographical maps; maps for particular purpoſes, ſuch as mines, foreſts, farms, inland navigation, &c. ſtatiſtical calculations of the ſquare contents and

and population of departments; population of cities, &c.

To this Board alſo belongs the calculation of new mathematical tables, according to the centeſimal ſyſtem, (namely, one hundred degrees to a quadrant, one hundred minutes to a degree, one hundred ſeconds to a minute, &c.) both for the natural and the logarithmic ſines, tangents, &c. According to ſome *formulæ* publiſhed by Prony, the ſine of any angle after 30° 10′ on the top of the page, is calculated by the differences 1, 2, 3, 4, &c. for every ten ſeconds, while the differences are invariably the ſame. The number of decimals, if my memory do not fail me, amounts to ſixteen places. At the bottom of the page, the ſine is in like manner calculated for the angle there ſituated, 30° 30′, with all its differences. By the regular method of adding the difference, one finds the ſine of 30° 10′ 10″, of 30° 10′ 20″, of 30° 10′ 30″, &c. and can proceed all the way through, to 30° 30′, at the bottom of the page. By the differences,

and

and their additions, the ſame reſult will be given to the lowermoſt angle at the bottom of the page, as has been calculated by Prony's *formula* of infinite ſeries. By this method, thoſe difficult calculations are made ſo perfect and ſimple, that any one can fill up occaſional deficiences. Thoſe tables are calculated by two perſons, who compare their reſults; ſo that no error can remain undetected. The page is to contain the logarithms of ſines, tangents, coſines and cotangents, moſt of which are already calculated. Prony ſhewed me ſome ſtereotype proofs of the impreſſions of thoſe tables, by Didot, inventor of that mode of printing.*

* The appoſite name, *Stereotype*, may have been firſt applied by that excellent printer, Didot; but the *art* was invented, about the year 1725, by a Mr. Ged, who, among other books, printed a very neat 24to. edition of Salluſt, by that method. But, after perſevering many years, he was obliged, by a ſhameful combination, to abandon it. I have Ged's Salluſt, and have ſeen his plates of the 13th and 102d pages of that work, which has for imprint, "EDINBURGI: *Gulielmus Ged, aurifaber Edinenſis, non typis*

 mobilibus,

It will be very long before thoſe laborious, expenſive, and copious tables can be printed; but they will be the moſt complete and ac-

mobilibus, ut vulgo fieri ſolet, ſed tabellis, ſeu laminis fuſis, excudebat, MDCCXLIV," that is, "Edinburgh: Printed by William Ged, Goldſmith in that City, not with common moveable Types, but with fuſed, or caſt, Plates, 1744."—In 1782, Mr. Alexander Tilloch revived, or rather re-diſcovered, this art; for he was ignorant of Mr. Ged's invention, till long after he had perfected his own; and, in the ſucceeding year, he took out a patent for it, in conjunction with Mr. Andrew Foulis, printer to the Univerſity of Glaſgow. In attempting to introduce it, they experienced ſome illiberality from the bookſellers. Yet they printed ſeveral volumes in that way, one of them a 4to Xenophon, and ſold them to the *Trade*, without their knowing how they were printed. Conſtant occupation and other cauſes have prevented the parties from availing themſelves of their patent; but Mr. Tilloch had brought the art to ſuch perfection, that the people employed made plates of *all ſizes*, with as much facility and certainty, as if they had been making tiles, or purſuing any other proceſs, which requires mere labour, without ingenuity. Mr. Tilloch obviates the great objection to his art, by cutting out and replacing, any damaged or erroneous part of a plate, with the utmoſt eaſe.

Tranſlator.

curate

curate that have ever appeared. Prony has conſulted all his preceding labourers, Rheticus, Vlacq, Petiſcus, Gardiner, Schultz, Vega, &c. In the new ſtereotypic edition of Callet's Tables, the ſines are inſerted after the new diviſion of the quadrant into 100°, but not into centeſimal minutes.

Borda intends publiſhing new tables of ſines, in centeſimal degrees, minutes, and ſeconds, conſtructed in a commodious and perfect form, for finding out the ſeconds; nearly on the ſame plan as that on which Pezena and Callet's tables are conſtructed for 90 degrees, with ſexageſimal diviſions. On my viſits to Borda, I have often found him occupied in correcting his tables. He complained that he could procure no paper, and muſt ſtill defer the printing of them. Since the revolution, manufactures of almoſt every kind, have either been ſtopped, or carried on very ſlowly. Money, that great ſpring which keeps the world in motion, has been wanting in their manufactures, commerce and every eſtabliſhment what-

ever. In ſome parts of the country, the want of men has alſo been felt; for, when it is conſidered, that the government have, this laſt year, impoſed a conſcription of 200,000 men, beſides from 4 to 600,000 already carrying arms, hands muſt neceſſarily be wanting in manufactories, which, even before this conſcription, were at a ſtand.

It has been already ſhewn, that geographical maps are under the ſuperintendance of the Board of Geography. Caſſini and De la Hire had, in the cloſe of the laſt century, proceeded in meaſuring a part of the meridian of Paris; Caſſini, the ſon and grandſon, have ſince completed the reſt of the meridian through France, and to this meridian have drawn a perpendicular. Finally, Caſſini and De la Caille, in 1740, repeated the whole meaſurement of the meridian through France. See "*La Meridienne verifieé par Caſſini de Thury, Paris*, 1744." Since that time, the geographical ſituations of many ſea-ports, towns and churches have been determined, and their latitudes and longitudes

longitudes accurately aſcertained. Beſides drawing this meridian over a part of France, as a baſis for an exact and general map, the Caſſini's had it in view to compleat theſe great triangles, by a general admeaſurement of the ſituations of particular places, country towns, caſtles, encloſures, woods, roads, ſeas, rivers, ſea-coaſts, &c. and to publiſh an exact general map of France. But the neceſſary advances and ſubſcriptions were wanting for purchaſing inſtruments, and paying for the ſurveys, and for drawing, engraving, and publiſhing the maps. Theſe extraordinary expences, however, were defrayed, partly by the ſupport of government, and partly by private contributions and loans. An account of theſe ſubſcriptions and contracts is to be ſeen in "*Deſcription Géométrique de la France, par M. Caſſini de Thury, Directeur de l'Obſervatoire Royal, à Paris*, 1783, *pp.* 194—200: *Projet et Acte d'Aſſociation, pour l'entrepriſe d'une Carte générale de France, par M. Caſſini de Thury, pp.* 200—207: *Projet de*

Souſcription pour la Carte de France, en 170 feuilles, propoſé par M. Caſſini de Thury.

The work was begun about the year 1740, and is at this time continued. Theſe maps which, by the beſt informed geographers, are called The Caſſinian Maps, are one hundred and eighty-three in number, and form an atlas of France, ſo accurate and beautiful, that no other ſtate whatever can produce a ſimilar work. In the ſmall kingdom of Denmark, the Academy of Sciences have at leaſt imitated, if not ſurpaſſed, this excellent deſign: and it is with pleaſure I reflect, that thoſe geographical admeaſurements were the principal labours of my youth, and are ſtill carried on under my direction. The preſent Caſſini and his aſſociates had almoſt finiſhed a general map of France, when the revolution took place.

I have before obſerved, that Caſſini was ſuſpected of royaliſm and ariſtocracy. The ruling party ſeized the draughts of the admeaſurements, drawings, and copper-plates,

and

and even the innocent white paper belonging to Caſſini, and depoſited them altogether at the Board of Geography, where they ſtill lie, and of which, for the preſent at leaſt, no impreſſion can be obtained; ſo that the Caſſinian maps will, in future times, be a rare and ſcarce collection. Caſſini complains bitterly on the ſubject, and has ſhewn me copies of ſeveral petitions to the Government for reparation. It is poſſible that government may have good and ſufficient reaſons for preventing the circulation of theſe charts, while internal commotions are apprehended; but, on the other hand, equity and juſtice require that the property of Caſſini and his aſſociates ſhould not be injured, and that the loſs they have ſuſtained ſhould be made good.

The National Library, formerly the King's Library, is ſituated in *Rue de la Loi*, formerly *Rue Richelieu*, oppoſite to the great Opera-houſe. The ſouth ſide faces the *Rue Neuve des petit Champs*, and its north ſide is in the *Rue Colbert*. The building

of the library, with its appurtenances, is very large; its length in *Rue de la Loi* being no leſs than eighty-five toiſes, and its breadth between the two ſtreets abovementioned, twenty toiſes. In the court of the National Library, is a fine ſtatue of bronze, repreſenting a woman ſtanding on one foot, in a very eaſy and natural attitude. The principal floor of the building, which ſurrounds this large court, is entirely filled with books, from the floor to the cieling; it is ſurrounded by a ſlight gallery, from which one can reach the books on the upper ſhelves. At the windows, and in different parts of one of the wings, tables have been placed for the accommodation of readers. While the weather continued mild and fair, I always found from forty to ſixty perſons, ſome of them ladies, reading at thoſe tables. The library is open every day, except the decade days, from ten to two, for the accommodation of readers; but no books are lent out. For ſuch as only wiſh to ſee the library, it is open from ten to two

two, every third, ſixth, and ninth day of the decade.

In a ſmall receſs of one of the four ſides of the library, is a group of about five feet in height and ſix in breadth, erected in the time of Louis the Fourteenth. It repreſents, as far as I could collect, Parnaſſus with Apollo and the Muſes, and ſeveral attributes applicable to the æra of that Monarch. There are alſo in the library ſome buſts of celebrated French *literati*, and of others, who have contributed to the improvement and augmentation of the library.

In the other wing of the library, a very large perforation in the floor preſents two large globes, the celeſtial and the terreſtrial, which ſtand on the floor below, and their upper parts project above the floor of the library. Theſe globes are thirty feet in diameter. The Meridians and horary circles are gilded. On the terreſtrial globe, the water is coloured blue, and the land white. Cities are painted with red and gold colours, and the mountains with a

green ground, and ſhaded with brown. The ground colour of the celeſtial globe is a light blue, and the figures of the conſtellations of a darker blue; the fixed ſtars are inſerted according to their right aſcenſion, declination, and magnitude, and all very thickly gilt. Theſe globes are very well executed, and are the largeſt I have ever ſeen. They are a piece of art characteriſtic of the cloſe of the laſt century, when they were made, and when large globes were in great repute. But they are, in fact, nothing more than an aſtronomical luxury, a piece of ſcientific profuſion, of no real effectual ſervice; though they muſt have coſt a very conſiderable ſum of money.

Caperronnier, the preſent librarian, ſuppoſes the library to contain about 300,000 volumes. It is very incomplete in modern literature; for, ſince the year 1789, no new books have been added to it, not even French, and much leſs foreign productions. Of this laſt deſcription, ſeveral capital works ſeem wanting; ſo that in the midſt of this great

great opulence, a kind of literary penury is ſtill felt. The national and other libraries have received conſiderable augmentations from the libraries of monaſteries and emigrants. This is an eaſy, and a very cheap method of increaſing a ſtock of books.

The manuſcripts, to the number of 80,000, are in more retired apartments. The oriental manuſcripts are kept by Langlés; thoſe in Greek and Latin by Laporte Dutheil; and thoſe in the modern languages by Legrande. The manuſcripts are divided agreeably to this claſſification, and are well arranged. Since theſe ſubjects are foreign to my ſphere of ſtudy, I ſhall only relate ſuch obſervations as I made, in a curſory manner. Here is a complete collection of Colbert's letters in about ſixty volumes. A volume of letters, ſome in Engliſh and others in French, written by Henry VIIIth of England, in a good, legible hand. A volume of letters from King Henry IVth of France to one of his miſtreſſes: his hand-writing is tolerably neat

and legible, and he has expreſſed himſelf with much vivacity and gallantry. To indicate the ardour of his amorous attachment, he ſays, "*Je vous aime plus, que vous aimez vous meme.*" I love you more than you love yourſelf. Here is a large collection of the French King's *heures*, or miſſals, all written very beautifully on the fineſt vellum, and embelliſhed with elegant borders and fine drawings, moſt of them ſcripture hiſtories. On every leaf of one of thoſe miſſals, is a beautiful drawing of a flower, with its name in Latin and French, ſo that it forms a collection of botany as well as religion. Vanquiſhed Italy has been obliged to contribute her mite to the treaſury of the national library; for all the moſt valuable printed books and the ſcarceſt manuſcripts, have been taken from the Italian libraries. Among thoſe Italian manuſcripts, I particularly obſerved two Codices in parchment, a Terence, and a Horace, from the library of the Vatican. I am no hunter after various readings; yet it is poſſible that

theſe Codices have no critical merit, but are remarkable only for their external beauty and excellent preſervation.

Two rooms belonging to the library are filled with a large collection of prints, which are under the ſuperintendance of Joly. Some pieces are hung to the walls, but moſt of them are in port-folios and caſes. Here in particular is a collection of about ſixty volumes of prints of remarkable tranſactions and events, in the hiſtory of France, arranged according to the year, or reign, down to the time of Louis XV.

The collection of antiques and coins is at the end of the library: the keepers are Barthelemy and Millin. The latter gentleman is remarkably attentive to ſtrangers, and every ſeventh day of the decade has an agreeable party to drink tea at his houſe, where he is glad to ſee foreign travellers. Mr. Manthey, ſecretary to the Daniſh embaſſy, whoſe civility and goodneſs I thankfully acknowledge, firſt introduced me to this ſociety, in which I enjoyed much com-

fort

fort and ſatisfaction during my ſtay in Paris.

Millin reads public lectures on archæology every ſecond, fifth, and eighth day of the decade. He is editor of the *Magazin Encyclopédique*, and is well known by his other publications. The collection of antiques and coins is not open to the public, but is to be ſeen by particular permiſſion. Millin had the goodneſs to ſhew this collection to Captain Friboe, Mr. Wedege, Mr. Duncan, myſelf, and other travellers.

Straight againſt the entrance and over the chimney-piece, various Egyptian antiquities meet the eye; ſuch as an altar of baſalt, an Iſis, Anubis, and ſeveral curioſities of bronze, ſtone, and burnt clay. Here is a mummy taken to pieces, the upper covering having been taken off, and extended upon the wall: it is remarkable for its fine colour and drawings, which without doubt were emblems of religious ceremonies. Near the fire-place are drawers, containing French and other medals,

dals, chiefly of gold. On the wall to the right of the door, are hung up lamps, and ſacrificing knives and veſſels of bronze. Between the windows, on the ſame ſide, are ſeveral large cheſts with glaſs-lids, containing antiquities of the primitive times of Chriſtianity, chiefly Greek. In the third and fourth diviſions, are ſtones cut in *bas-relief*, ſome of them Greek, and others Roman productions. Almoſt all of them have been executed in ſtones, which have their *laminæ* of different colours, diſpoſed in ſuch a manner, that the features of the figures had one colour, but the hair, helmet, clothes, &c. different ones. There are among them many beautiful and excellent pieces. At one end of the room, are ſeveral warlike inſtruments of different Indian nations. On the floor, ſtands a large antique marble table, with a Latin inſcription; and the walls are decorated with the ſhields of Scipio and Hannibal, which were once ſuſpended in temples. They are of ſilver, and of very beautiful workmanſhip.

By

By the ſide of them are placed the arms of Francis the Firſt, ſuch as his helmet, ſhield, ſword, battle-ax, and ſpurs, all of ſteel, inlaid with gold, and moſt exquiſitely formed. On the ſhield are Arabian drawings, executed with regularity and taſte. His ſtirrups which are of ſilver, gilt and carved with open work, are placed underneath.

Between the windows on the left hand ſide, are ſeveral intaglios: in the ſides of moſt of them are inciſions through which one can diſcover their comparative beauty. At the end of this ſide is a caſe which contains a very valuable ſtone, with ſeveral figures projecting out of it. It is about twelve inches high and ten inches broad, and having been broken quite through, it has been joined with ſuch art, that the fracture cannot be diſtinguiſhed. In this caſe are different vaſes of ſtone, one of which is of ſardonyx, about ſeven inches high, and five in diameter. Millin aſſured us, that the pieces in this caſe are the moſt beautiful

beautiful and curious of their kind in Europe.

In the middle of this cabinet of antiquities, is a long table covered with Hetrurian vaſes of ſuperior beauty. Under the table are drawers, containing Greek and Roman coins, both of gold and ſilver, and a veſſel of the former metal, about eight inches in diameter, in which are a great number of old gold coins.

After having viewed this room, where every thing was arranged in the beſt manner, Millin conducted us to the third floor, where are two apartments, which contain a very large and remarkable aſſemblage of antiquities; Hetrurian vaſes of extraordinary magnitude; a bathing veſſel of porphyry in good peſervation; figures in bronze; ſacrificing knives, lamps, houſehold furniture, &c. not ſuſpended ſeparately on the walls, but placed here and there along the floor, as convenience admitted. Thoſe apartments on the third floor, ſeemed to be more diſtinguiſhed as antiqua-

antiquarian lumber rooms, than for any regular arrangement of the many valuable curiosities which they contain. Millin, for above three years, has been requesting money for constructing cases and shelves for arranging and containing this chaos of antiquities; but his applications have not yet been attended to. He is full of zeal and activity in this his favourite pursuit: he complains that the study of ancient literature and arts are not only neglected, but totally despised, as unnecessary for forming a good taste and accurate ideas of the fine arts. On the first of Vendemaire, or last of September, none of the attendants belonging to this collection had received any salary for the preceding eight months.

By a decree of the 10th Germinal, in the third year, a school was instituted, adjoining to the National Library, for the modern oriental languages, where public lectures are delivered by Langlés, on the Persian and Malay languages; by Silvestre Sacy, on the common and learned Arabic; and

and by Bohenam, on the Turkiſh and Tartarian.

While I was in Paris, my countrymen, Dr. Müller, Dr. Engleſtoft, and Dr. Thorlacius were alſo in that city. As thoſe gentlemen regularly viſited the National Library, they will be able to give very particular accounts of that eſtabliſhment; nor is it to be doubted, that when opportunity ſerves, they will favour the public with ſome of their obſervations.

Beſides the public libraries mentioned in this and preceding letters, there are the two following:

1. The library of the arſenal, which is ſuppoſed to contain 75,000 printed volumes, and 6,000 manuſcripts, and which formerly belonged to the Count d'Artois. It is open every firſt, ſixth, and eighth day of the decade, from ten till two.

2. The library of the Pantheon, formerly the library of St. Genevieve, which conſiſts of about 100,000 printed volumes, and 2000 manu-

2000 manuſcripts, and is decorated with different marble buſts of French *Literati.*

Before I quit this ſubject, I muſt remark, that on the firſt appearance of terroriſm, the libraries, paintings, natural curioſities, and inſtruments of ſuch as were baniſhed or put to death, were partly deſtroyed, and partly carried off. But the more prudent put a ſtop, as ſoon as poſſible, to thoſe robberies; and it was reſolved, that all ſuch articles ſhould be conſidered as national property, and be collected and preſerved, until farther orders. Of ſuch collections of books, three depots have been formed one in *Rue des Capucins*, one in *Rue des Cordeliers*, near the Medical School, and one near the Central School in *Fauxbourg St. Antoine, ou ci-devant Jeſuites.* Thoſe books are now arranged and diſtributed among the libraries of other Inſtitutes in Paris, and in the departments; and I have often ſeen cart loads of books taken from thoſe collections.

LETTER

LETTER XIV.

THE NATIONAL INSTITUTE, WITH AN ACCOUNT OF ITS MEETINGS.

Academy of Sciences, &c. founded by Louis XIV. and Colbert—Reſpectable at the Revolution—National Inſtitute, founded on their Ruins, more comprehenſive—Its Members, Claſſes, Sections, and Times of Meeting—Propoſes Prize Queſtions—Its Members and Pupils to travel for Information, at the Public Expence—Is the firſt learned Body in Europe—National Palace of the Arts and Sciences deſcribed—Fire-eſcapes, which did not anſwer the End—Meetings of the Inſtitute, and Memoirs read—Miniſterial Impertinence and Partiality, in the Caſe of Bralle—Numerical Telegraph propoſed—Maſkelyne's Name partially omitted in a Report concerning the Longitude—Excellent Pun—Mercury frozen—Severe Froſt at Paris—Reviews of the Inſtitute, impartial and well written—Miniſters often aſk the Opinion of the Inſtitute—Its

—Its ſolemn Meetings—Artiſts rewarded and crowned.—Arts and Manufactures—New Animal—Bougainville's Eulogy of Cook, &c.—Memoirs, Publications and Purſuits of the Members of the National Inſtitute—The Author falſely accuſed of calumniating that learned Body.

LOUIS XIV. and his miniſter Colbert, were both favourable to the ſciences. Seeing their happy influence on navigation, arts, manufactures and trade, they encouraged and patronized the cultivators of ſcience and uſeful arts. In order to promote agriculture, and extend ſcientific inquiries, Louis XIV. founded "The Academy of Sciences," which comprehended mathematics in all their branches, phyſics, natural hiſtory, chemiſtry, and medicine: he alſo eſtabliſhed the Academy of *Belles Lettres*, the Academy of Inſcriptions, the Academy of Surgery, and the Academy of Architecture. Theſe academies, as appears from their memoirs, have always conſiſted of able and ſkilful men, who have thrown new

new light on the arts and ſciences, in their writings, and have enriched them by numerous and important diſcoveries. At the commencement of the Revolution, the Academy of Sciences in particular, included ſome of the greateſt men in Europe, in their reſpective departments. To be convinced of this, we need only name the mathematicians Lagrange and Laplace; the chemiſts Lavoiſier and Fourcroy; the natural hiſtorians and mineralogiſts Daubenton, Lacepede, and Hauy; the aſtronomers Lalande, Meſſier, and Delambre; not to mention many others who have contributed more or leſs to the extenſion of ſcientific inquiries.

During the Revolution, all preceding monarchical inſtitutions underwent a change, and even the free temples of the ſciences were ſubverted. Upon their ruins, was founded the National Inſtitute, which not only comprehends all the branches into which the academies of ſciences, and of the *Belles Lettres*, were formerly ſubdi-

vided,

vided, but alſo includes logic, morals, and politics.

The decree, which eſtabliſhed the National Inſtitute, paſſed the 3d Brumaire, 4th year, or the 24th of October, 1795. According to this decree, the Inſtitute belongs to the whole republic; but is to be ſituated in Paris. Its object is, to extend the limits of the arts and ſciences, by diſcoveries and inquiries, and by correſponding with learned ſocieties in foreign countries. By the reſolution of the Directory, the Inſtitute is to undertake and promote ſuch ſcientific labours as conduce to the general utility and honour of the Republic. It conſiſts of 144 members, reſiding in Paris, and of an equal number in other parts of the Republic, and it may additionally admit eighty foreign aſſociates; but they have not yet been choſen. The National Inſtitute conſiſts of three claſſes: the firſt, or mathematical and phyſical claſs, is divided into ten ſections, each of which has ſix members.

The 1ſt ſection. Mathematics; Lagrange,

grange, Laplace, Borda, Boſſut, Legendre, and Delambre.

2d Sect.—Mechanics; Monge, Prony, Leroy, Perier, &c.

3d Sect.—Aſtronomy; Lalande, Mechain, Meſſier, Jaurat, &c.

4th Sect.—Experimental philoſophy; Charles, Briſſon, Coulomb, Lefevre, &c.

5th Sect.—Chemiſtry; Berthollet, Guiton Morveau, Fourcroy, Vauquelin, &c.

6th Sect.—Natural hiſtory and mineralogy; Darcet, Hauy, Dolomieu, &c.

7th Sect.—Botany; Lamarc, Adanſon, Juſſieu, L'Heretier, &c.

8th. Sect.—Anatomy and Zoology; Daubenton, Lacepede, Cuvier, &c.

9th Sect.—Medicine and Surgery; Deſfarts, Sabatier, Portal, Laſſus, &c.

10th Sect.—Agriculture and the Veterinary art; Thouin, Cels, Parmentier, &c.

There are, in all, in this claſs, 60 members at Paris, and an equal number in the departments, where they are alſo di-

vided into ten ſections, each conſiſting of ſix members.

The ſecond claſs comprehends Moral and political ſcience, and is divided into ſix ſections, each conſiſting of ſix members; in all thirty-ſix members, and as many in the departments.

1ſt Sect.—The analyſis of ſenſations and Ideas.—2d Sect. Morals.—3d Sect. Civil ſociety and laws.—4th Sect. Government.—5th Sect. Hiſtory.—6th Sect. Geography.

The third claſs is occupied with literature and the fine arts, and is divided into eight ſections, each ſix members; in all forty-eight members in Paris, and as many in the departments.

1ſt Sect. Language or grammar.—2d Sect. Ancient languages.—3d Sect. Poetry.—4th Sect. Antiquities and monuments.—5th Sect. Painting.—6th Sect. Sculpture.—7th Sect. Architecture.—8th Sect. Muſic and Declamation.

Every

Every claſs meets twice in every decade; the firſt claſs on the firſt and ſixth days; the ſecond on the ſecond and ſeventh days; and the third on the third and eighth days. Each claſs has its preſident and two ſecretaries, who are elected by the claſs they reſpectively belong to, and continue in office for ſix months.

On the 5th day of the firſt decade, in every month, the three claſſes unite, and hold a general meeting, to deliberate on ſuch affairs as relate to the general intereſts of the Inſtitute. The oldeſt of the three preſidents of the claſſes then takes the chair, and acts as preſident of the whole Inſtitute.

The National Inſtitute has four public quarterly meetings; namely, on the 15th of the months of Vendemiaire, Nivoſe, Germinal, and Meſſidor. Each claſs annually propoſes two prize queſtions; and in theſe general meetings, the anſwers are made public, and the premiums diſtributed. The united ſections of painting, ſculpture,

and architecture elect the pupils who, at the expence of the Republic, are to travel to Rome, and to reside at the national palace, in order to study the fine arts. By virtue of a decree of the 3d Brumaire, 4th year, the Institute should likewise elect twenty young men, to travel in France and foreign countries, for the purpose of studying rural œconomy. Six members of the Institute itself, are also to travel at the public expence, in order to collect information, and to acquire experience in the different sciences. But I do not apprehend that any of these scientific expeditions have been performed; war and the want of money having probably obstructed these very useful undertakings.

It may be presumed, that the members I have named, in the several sections of the mathematical and physical classes, are the most celebrated and eminent men in these scientific departments. The two other classes are also composed of members equally respectable; and, upon the whole, it

it cannot be denied, that the National Inſtitute of France is the firſt learned body in Europe.

Among the many pleaſures I have derived from my travels, I account it the greateſt that I have become perſonally acquainted, and frequently converſed, with ſo many excellent men, all eminent in their reſpective purſuits. I may particularly mention Lagrange, Laplace, Borda, Boſſut, Legendre, Delambre, Prony, Perier, Lalande, Mechain, Meſſier, Jeaurat, Charles, Briſſon, Coulomb, Lefevre-gineau, Fourcroy, Vauquelin, Darcet, Hauy, Lacepede, Cuvier, L'Heretier, and Gregoire. The remembrance of theſe excellent men will always be dear to me, and I ſhall ever thankfully acknowledge their friendſhip and civility. As ſoon as I arrived at Paris, I was preſented, by Mr. Secretary Dreyer, to Talleyrand and Perigord, the miniſters for foreign affairs, by whom I was introduced to François Neufchateau, the miniſter for the interior, and by him again to

the mathematical and phyſical claſs, whoſe preſident at that time was Boſſut, well known for his many excellent mathematical writings.

This chearful, good man received me with much civility and friendſhip; he informed me who were the French commiſſioners for weights and meaſures, and that the Inſtitute had reſolved that the foreign commiſſioners, during their ſtay in Paris, ſhould be conſidered as members of the Inſtitute, and have free admiſſion to every particular claſs, and to their general and ſolemn meetings. He then delivered to me an oval printed card, inſcribed round one ſide *Republique Françaiſe:* in the middle *Citoyen Byggé, Membre et Commiſſaire de l'Inſtitut National des Sciences et des Arts:* and it was ſubſcribed *Cels, Preſident de la Commiſſion des Fonds, et de la Bibliotheque.* On the other ſide were printed the words, *Le Citoyen Byggé, Commiſſaire des poids et meſures, envoyé de Dannemark.*

The apartments of the Inſtitute are on the

the firſt floor of the *ci-devant Louvre*, now called the *Palais National des Sciences et des Arts*. At the entrance is an elegant anti-chamber, through which one enters the hall of the Inſtitute, which is oblong, lighted by windows in each end, and hung with tapeſtry. Small tables covered with green cloth are placed parallel with the walls and windows. In the middle of one of the longeſt ſides, is the chair of the preſident, and his two ſecretaries are ſeated one on each hand of him. Straight before the preſident, in a rectangular ſpace, is a table where thoſe who have any thing to read uſually ſtand, particularly if they be not members of the Inſtitute. Within this ſpace, a table was placed for the foreign commiſſioners for weights and meaſures. The length of the hall is ſufficient to admit twenty-ſix perſons to ſit at each of the longeſt ſides of the tables, and about ten may be ſeated at each end, beſides benches for ſtrangers adjoining the wall and windows. On one ſide of this great hall, is a

ſmaller apartment for the reception of the communications of correſpondents. The library, in three large apartments, contains about 16,000 volumes, including the tranſactions and memoirs of the former French academies, and of foreign ſcientific eſtabliſhments and literary ſocieties. The Inſtitute has alſo an apartment for the ſecretary and his aſſiſtant; and a large room for a collection of machines and models, wherein are many pieces of mechaniſm which belonged to the old Academy of ſciences: and a great number of models of all kinds of ſhips; for this room was once uſed as a model-room for the ſtudents of naval architecture.

Since the eſtabliſhment of the Inſtitute, there have been depoſited here more than twenty models of machines, intended to enable people to eſcape from the upper ſtories of buildings on fire. Of theſe models the deſcriptions and drawings of three, which were looked upon as the beſt, have been publiſhed, under the title of *Rapport ſur*

ſur les moyens de ſauver les perſonnes, renfermées dans les maiſons incendiées, par Prony, Couloumb, Peyre, Bougainville, Perier et Boullée.

In the garden of the *Palais Royal*, now the *Palais d'Egalité*, a building had been erected, one hundred fathoms in length, and chiefly of wood. In 1798, this building took fire, and during this violent and dangerous conflagration, ſome of thoſe machines were produced and tried; but were conſumed along with the building.

I have been ſeveral times at the meetings of the ſecond and third claſſes; and thoſe of the firſt, or mathematical and phyſical claſs, I almoſt always attended. ſhall give ſome curſory accounts of what paſſed in thoſe meetings. The preſident, Boſſut, conducted me to the National Inſtitute on the 11th Fructidor, or 28th of Auguſt. The meeting began, as it generally does, at ſix o'clock, and continued till eight. It was opened, as uſual, by reading an abſtract of the proceedings in the

meeting, which was this evening followed by a chemical diſſertation on the analyſis of ſaliva, with phyſical concluſions thence deduced. Portal, the phyſician, did not ſeem ſatisfied with it, but objected that it was impoſſible to reaſon on effects in the human body, from thoſe which caſually took place in glaſſes and retorts. Chaptal read a method of producing from vegetables, a material which communicates to linen and woollen manufactures, a much more beautiful and durable yellow than the common one.

Dizé, a pupil of Darcet, read a treatiſe on light and caloric, wherein he attempted to prove that theſe principles are always united, and are only one and the ſame element in nature. He had mixed alkalies and acids, which by combuſtion produced heat, and he had very often ſeen, in the dark, ſparks emitted by the mixture. Laplace, who has extended the limits of ſeveral branches of ſcience, and who often ſpeaks before the Inſtitute, with that order and clear-

clearneſs of thought which might be expected from ſo eminent a man, raiſed a doubt, whether this light might not be electric. He ſaid he remembered to have made a ſimilar experiment along with Lavoiſier; and adviſed the author to repeat it, and for the greater certainty, to inſulate the veſſels.

Maindon, a lieutenant in the navy, produced a new graphical method of aſcertaining the obſerved diſtance between the ſun and moon, or a fixed ſtar and the moon, in order to find the refraction and parallax, in obſervations for finding the longitude at ſea. This treatiſe was delivered to Borda and Leveſque of Nantes, (known for his excellent book on navigation) for them to report their opinion of it to their Inſtitute.

The Inſtitute in its manner of debating, reſembles the Engliſh Societies. Any individual who is inclined to ſpeak, aſks leave of the preſident, to whom he addreſſes his diſcourſe, and every individual ſpeaks in

order which his inclination ſuggeſts. Hence thoſe debates are carried on with regularity, decorum, and mutual reſpect.

At the meeting of the 16th Fructidor, or the 2d of September, a programma was read by François de Neufchateau concerning the feſtival of the 18th of Fructidor. Chaptal read a memoir, in which he and other chemiſts were diſpoſed to prove, that there was an eſſential difference between acetic and acetous acids: his experiments and proofs appeared to me to be very convincing. Beaumé, who is ſtill an advocate for the phlogiſtic ſyſtem, raiſed ſeveral objections. Fourcroy ſpoke with his uſual elegance and ſolidity, and ſupported Chaptal's propoſitions. Two petitions from Beaumé and le Sage were produced, praying for an augmentation of their ſcanty allowance. In conſequence of the opinion of the Inſtitute, thoſe petitions were ſent to the miniſter of the interior, and both were recommended to his attention. A ſimilar petition was read from one who mentioned his

his having travelled with the Abbé Haute Roche, and aſſiſted him by his aſtronomical obſervations: but as none of the aſtronomers knew this man, or had heard any thing of his abilities and labours, his petition was not recommended.

In a meeting of the National Inſtitute on the 6th of Vendemiare, in the 7th year, or 27th of September, 1798, the famous botaniſt Juſſieu, elected preſident in the room of Boſſut, who went out in turn, took the chair. Juſſieu having a very good voice, and a regular and diſtinct delivery, made an excellent preſident. The meetings, in the winter months, begin at half paſt five o'clock, and cloſe at half paſt ſeven. A letter was firſt produced from the Miniſter for the Interior, incloſing a plan for altering and improving the waterworks at Marly, propoſed by Bralle, the engineer. Prony and Coulomb having already offered plans for a ſimilar improvement, the miniſter propoſed, that they ſhould be authorized to examine this project

ject of Bralle. Laplace, Borda, and many more objected to this propoſal, whilſt others ſupported it. It was finally decreed, by a majority of voices, to write to the miniſter, that, if he requeſted the opinion of the mathematical and phyſical claſs, he muſt permit them to elect their own committee; but, if he only wiſhed to have the opinions of Prony and Coulomb concerning this plan, it ſhould be ſent to them accordingly.

Guiton Morveau read an extract of a work ſent to the Inſtitute, concerning an analyſis of Spaniſh minerals. Chaptal read a very favourable account and report of Dize's memoir on the identity of light and caloric. Laplace read an account of the diſruptions of the dykes near Doel in Flanders, which happened under circumſtances cauſing the higheſt tides. It was new moon, near the equinox, and the moon was, at the ſame time, in perigee, or neareſt the earth, and conſequently acting with her greateſt poſſible force.

At

At this meeting was exhibited a model of a new telegraph, calculated to make ſignals by numbers. There were three perpendicular poles A D, B E, and C G. (See fig. 3.) The firſt pole may be allotted to units, the ſecond to tens, and the third to hundreds; and to expreſs the numbers of each, long pieces of board, *a*, *b*, *c*, can be ſuſpended on every pole reſpectively. For example; when there are ſix pieces of board on C G, two on B E, and four on A D, the ſignal is 624. A particular ſignal may be made by a flag hoiſted on B E, to repreſent what A D, B E, and C G denote in their decuple order. For inſtance; a white flag may ſignify the value firſt ſhewn; a red flag may ſhew that A D is 1000, B E 10,000, and C G 100,000; a blue flag may denote units, tens, and hundreds of millions; and a yellow flag, 1000 millions, 10,000 millions, and 100,000 millions, &c. On this principle, a ſignal ſyſtem was propoſed to be calculated, and a protocol of ſignals to be formed, wherein certain

certain numbers were to denote certain ſyllables, words, and meanings, according to which the ſignals of the telegraph were to be given and read.

This method is undoubtedly well contrived; but it appears to me, that the telegraphs now uſed at Paris, with two moveable arms, which ſtand as different angles, in order to ſignify different ſyllables, are more ſimple in ſtructure, and expeditious in practice *.

Fourcroy,

* It may not be amiſs to obſerve, that a particular deſcription of a telegraph, illuſtrated by wood-cut figures, and dated 1684, is to be ſeen in an octavo volume, entitled, "Philoſophical Experiments and Obſervations of the late Dr. Robert Hook," and publiſhed by Mr. Derham, London, 1726. In that contrivance, the intelligence was to be conveyed by large wooden characters, ſome of them ſignifying whole ſentences, which were to be ſucceſſively brought into the field of viſion, and drawn back again into a ſide-box. Though far from being complex, it was not quite ſo ſimple as the French one, with moveable arms, of which our author ſpeaks. A ſimilar contrivance is mentioned, but not deſcribed, in the Century of Inventions,

Fourcroy, in the laſt place, read an excellent account of a chemical analyſis of *calculi* formed in the human bladder, undertaken by himſelf and Vauquelin. He had examined more than three hundred of thoſe concretions, and found that they all conſiſted of the ſame component parts; but that they ought to be reduced into different claſſes. He mentioned one mon-

ventions, of the Marquis of Worceſter, who, in a petition to Parliament, in the reign of Charles II. offered to publiſh the hundred proceſſes and machines therein enumerated, on condition that money ſhould be granted to extricate him from the difficulties, in which he had involved himſelf, by the proſecution of uſeful diſcoveries. But the petition does not appear to have been attended to. There were doubtleſs *other* uſes for money in that profligate and needy reign; and many or moſt of the Marquis's expenſive and admirable inventions were loſt, probably for ever! The ſteam engine, however, which may be plainly traced in his intereſting little piece, was afterwards re-invented by Thomas Savery, Eſq. who was treaſurer to the Sick and Hurt Office, and who gave the firſt deſcription of it in his book entitled, "The Miners' Friend."—*Tranſlator.*

ſtrous

ſtrous ſtone of the ſize of a melon. It is a luxury to hear this enlightened maſter treat of his ſcience, with ſo much zeal and preciſion.

At the meeting of the 11th Vendemiaire, or 2d of October, ſeveral members read various extracts of memoirs communicated to the Inſtitute; but none of any particular importance. Leveſque read, in his own and Borda's name, a report concerning lieutenant Maindon's graphical method of aſcertaining the diſtance between the ſun and moon, in order to find the parallax. This report began with an hiſtorical relation of the firſt attempts made for determining the longitude. The whole was written with great ingenuity; but a little national partiality ſtill prevailed, and the very great ſervice which Dr. Maſkelyne has rendered in this buſineſs were not thought worthy of notice. That able aſtronomer, by his *Mariner's Guide*, firſt contributed to promote and introduce the methods of diſtances among the Engliſh navigators;

navigators; and firſt propoſed the publication of the Nautical almanack, and the Requiſite tables to be uſed with it, which have afforded infinite aſſiſtance in the calculation of the Longitude.

Leveſque took ſome curſory notice of the ſeveral methods for calculating the Longitude ſuggeſted by Lyons, Dunthorne, Maſkelyne, and Borda. There appeared ſome degree of meanneſs in ſo often naming and commending Borda, who aſſiſted in drawing up this report; yet I am not on that account diſpoſed to depreciate, in any reſpect, the merit of Borda. The circle which Mayer invented, and Borda firſt brought into uſe in France, is an excellent inſtrument. Borda's method of calculating the Longitude is very good and expeditious; and he has been as active in introducing the Method of Diſtances among the French ſeamen, as Maſkelyne was in promoting it among the Engliſh. About four-fifths of this report was taken up by the above-mentioned well written hiſtorical relation;

relation; the remainder conſiſted of a particular account and opinions of Maindon's memoir. The theoretic principles and algebraic proceſſes, on which Maindon's invention depended, were ſhortly noticed, and, on the whole, his performance received becoming and well merited commendation. The Inſtitute reſolved that the report ſhould be printed; but the form gave riſe to debate. Some wiſhed it to be printed ſeparately, and others propoſed that it ſhould be inſerted in the ſecond volume of the memoirs of the Inſtitute; and this laſt propoſition was carried by a majority of voices. This day's tranſactions were cloſed by Prony, who read a letter from Delambre, mentioning that the meaſurement of a baſe-line near Perpignan, was very nearly completed.

At the meeting of the 21ſt Vendemiaire, or 12th of October, the preſident gave an account of ſeveral French and foreign communications received by the Inſtitute. Dr. Humbold read a memoir on the application

cation of the principles of modern chemiſtry to agriculture, and particularly in explaining the effect of manure on the growth of plants. The preſident read a liſt of reports of committees, which had not been returned to the Inſtitute, before the current academic year. Some preſent members of committees promiſed to bring them in with the required notices: others declared, that the reſpective authors had withdrawn their plans and memoirs, which plainly indicated a conviction of the impracticability of their propoſals, and the inconcluſiveneſs of their deductions. Some memoirs and reports could not be accounted for; and it was conjectured that they had been carried to Egypt by Monge and Berthollet, who had acted as members of committees.

The National Inſtitute had, by circular letters, requeſted deſcriptions of the climate, ſtate, agriculture, manufactures, natural productions, &c. of other countries; and when

when the Inſtitute had nothing particular to attend to, for the two hours of meeting, ſome of thoſe deſcriptions were read. It is evident that ſuch productions muſt have very different degrees of merit. This evening a piece was read, which contained accounts of Greece, Egypt, and Turkey, by Felix, the French conſul at Salonica. It ſeemed to poſſeſs no conſiderable merit, except its deſcribing countries, towards which the national attention was, at that juncture, particularly directed. After it was read, Deſſeſſarts, the phyſician, who either had not heard, or pretended not to know, the author's name, enquired who had written that memoir. The preſident anſwering it was Felix the conſul, Deſſeſſarts excited a general laugh, by rejoining, in his uſual facetious manner, "*Felix qui ſcripſit, infelix qui audivit.*"

Among the tranſactions of the meeting on the 11th Nivoſe, 7th year, or 31ſt of December, 1798, I ſhall only mention the very

very remarkable experiments made on artificial cold by Fourcroy and Vauquelin. Theſe experiments, which were formerly made on a ſmall ſcale, by Lowitz at Peterſburgh, have not only been repeated, but very conſiderably extended, at Paris. Within a large tub was placed a ſmaller one, and the interval between them was filled with a mixture of ſnow and ſalt, which produced a remarkable degree of cold. Within the ſecond was placed a third, and the interval between the ſecond and third was filled with a compoſition conſiſting of eight parts of muriate of lime, and ſix parts of ſnow. In the inner tub was very ſoon produced an intenſe degree of cold, which ſunk the common thermometer of Reaumer to 32° below zero. In order to keep out the external warm air, the whole apparatus was covered with a glaſs caſe. By theſe intereſting experiments, 20lb. of mercury was made to freeze in thirty ſeconds into a ſolid maſs, which

aſſumed

aſſumed a chryſtallized form.* Spirits of wine, the ſtrongeſt vinegar, nitric acid, pure ammonia, and æther, froze in like manner. A finger applied to this mixture or ſolution, in four ſeconds loſt all ſenſe of feeling, became frozen, and as white as paper, with a very acute ſenſation, reſembling a violent pinch. Moſt liquors froze, in a platina crucible, in thirty ſeconds; but, in a crucible of porcelain or clay, they required about two minutes, which is eaſily accounted for, from metals being more capable of conducting heat than clay.

The atmoſpheric cold, when thoſe experiments were performed, was 7° by the centigrade thermometer, or 5, 6° of Reaumur's. Decimals being quite faſhionable in France, thermometers are uſed, in which the diſ-

* In the Philoſophical Magazine, Vol. III. we have an account of 56lb. of mercury having been frozen in London, the ſame winter, by Meſſrs. Allan and Pepys, who produced the artificial cold by mixing muriate of lime with dry, uncompreſſed ſnow.—*Tranſlator.*

tance

tance between the freezing and boiling points, is divided into 100 degrees, inſtead of Reaumur's diviſion into 80 degrees. The Swedes have long uſed this diviſion, under the name of Celſius's, or Chriſtiernin's, thermometer.

On the ſame evening, Delambre and Mechain related to the Inſtitute an account of their obſervations on the cold this winter, which has been very ſevere at Paris, ſtating, that on the 5th, 6th, and 7th Nivoſe, the centigrade thermometer ſtood at 16,2°, and Reaumur's at 13°. The froſt firſt commenced in December, 1798; and, except a few days thaw, continued till the beginning of February, 1799. For ſome days in December and January, the thermometer ſtood at 13°, ſnow falling now and then, but ſeldom exceeding the depth of ſix inches, and the river Seine was frozen over. Indeed, ſevere weather is the more ſenſibly felt in ſouthern countries; becauſe the conſtruction of the houſes and

the apartments is not calculated to exclude the cold.

I have already obſerved, that when an author, whether French or foreign, ſends any publication to the Inſtitute, the preſident nominates a member of abilities in the ſcience treated of, to ſelect extracts from the work, and to read them at one of their meetings; a practice which has the advantage of making every member of the Inſtitute acquainted with the contents and merits of the book. Theſe reviews are always well written and impartial, conveying accurate ideas of the contents of every work—not like thoſe critiques in ſome other countries, which may rather be called reviews of authors and individuals, than of their writings; and which, being compoſed with a view to introduce the thoughts and opinions of the cenſors, inſtead of thoſe of the authors, are more of a didactic than a critical nature.

Many things are ſent from the miniſters for

for the opinion of the Inſtitute. Private individuals, in like manner, ſend in memoirs, drawings, or models of machines, plans of various practical works, &c. in order either to make them known, or to obtain ſome other advantage. The claſs, to which the matters communicated are ſubmitted, always nominates a committee to examine them, whoſe reports are read, and the communications are approved, rejected, or modified. It is natural to ſuppoſe that many projects are ſent in, which are neither important nor uſeful; and I have often pitied the members of the Inſtitute, in being obliged to ſpend much of their time on buſineſs of this kind.

Having thus given an account of ſome of the particular meetings of the National Inſtitute, or more properly of the mathematical and phyſical claſſes, which take place every firſt and ſixth days of the decade, I ſhall deſcribe two of their public or ſolemn meetings. Theſe meetings were not held

in the ſame room as their particular aſſemblies, but in another much more extenſive and beautiful, and which formerly belonged to the academy of ſciences. Both its longer ſides are adorned by two beautiful colonnades; and the ceiling is finely painted and decorated. Between the columns are fourteen beautiful marble ſtatues (ſeven on each ſide) of the greateſt and moſt celebrated men whom France has produced; namely, Condé, Tourville, Deſcartes, Bayard, Sully, Turenne, Dagueſſeau, Luxembourg, L'Hopital, Boſſuet, Duqueſne, Catinat, Vauban, and Fenelon. At the ends, are two ſitting figures of Paſcal and Rollin. In the antichamber, are the ſtatues of Moliere, Racine, Corneille, Lafontaine, and Monteſquieu. The hall is extremely well lighted, by chandeliers and ſilver lamps. The floor is covered with a carpet; tables are placed parallel to the four walls of the hall, at which the members of the Inſtitute took their places.

There

There are particular places for the Directory, the miniſters of the republic and foreign ambaſſadors.

The preſident of the Inſtitute is ſeated at the uppermoſt end of the hall; and in the middle, and rather on one ſide of him, is a tribune, from which whatever is propoſed is received by the preſident, who does not leave his chair. The place allotted for members is ſurrounded by a rail, between which and the walls there is round the whole hall a row of benches, where the ſpectators (among whom were many ladies) took their ſeats.

The firſt public quarterly meeting, at which I was preſent, was on the 15th of Vendemiaire in the 7th year, or the 6th of October, 1798. Juſſieu, the preſident, opened the meeting in a ſhort ſpeech, wherein he ſignified that, in the firſt place, an account of the labours of the National Inſtitute for the laſt three months, would be given by the ſecretaries of the different claſſes. Laſſus, after an extemporaneous

preamble, read a well written abſtract of the labours and memoirs of the phyſical claſs; Leſevre-gineau ſtated thoſe of the mathematical; Daunon thoſe of the moral and political claſſes; and laſtly, Andrieux read abſtracts of memoirs relating to the fine arts. In particular, he gave an account of a diſſertation by the famous Dupuis, who wrote the *Origine des Cultes*, and many other well known works, in which the author endeavoured to prove that Denis, the *ci-devant* tutelar ſaint of France, was no other than Bacchus. As this muſt be a very acceptable ſentiment to every Frenchman who is fond of wine, it was received with a general plaudit.

The preſident then delivered a ſhort ſpeech, on the progreſs which the arts muſt neceſſarily make among a people, where they are cultivated, eſteemed, and rewarded, and then crowned with green wreaths, the following pupils who have received premiums in the fine arts: Harriet and Le Roi for a painting repreſenting the

combat

combat of the Horatii and Curiatii; Laville for a baſſo relievo of Marcellus, the Roman general, who, after the ſacking Syracuſe, permitted his ſoldiers to carry ſpecimens of the arts to Rome; and Clemence and Pompon for drawings in architecture, and plans of an exchange. Theſe induſtrious young artiſts, by obtaining the firſt premiums, have acquired the right of being ſent to Rome, whenever circumſtances will permit, and there proſecuting their ſtudies at the expence of the republic.

In the next place, Camus delivered an extemporaneous diſcourſe, and gave an account of other great and important labours in which the National Inſtitute were engaged. Under the monarchical government, the Academies of Sciences and Literature had begun different works of importance to mankind, and which on that account would reflect honour on the nation. They intended to publiſh, 1. The whole of the

French hiſtorical writings; 2. French and foreign diplomatic papers; 3. A catalogue of the manuſcripts in the National Library; 4. Deſcriptions of arts and manufactures. Theſe deſigns were interrupted by the revolution; but every friend to ſcience and literature muſt hear with pleaſure, that theſe important labours are to be again undertaken, and that the preſent government will grant the ſupplies neceſſary for that purpoſe.

The National Inſtitute have nominated committees, who are to proceed on the plan of thoſe, who, under the former government, laboured on collections and editions of the old French hiſtorical writings, ſuch as Brial and De Clement, the famous author of "*L'Art de verifier les Dates.*" Theſe committees are alſo to confer with Dutheil and Brequigny, concerning a diplomatic collection. Camus aſſured the Inſtitute, that a volume of the old hiſtorical writings, collected by Brial and Druons,

and

and another of diplomatic papers, collected and published by Dutheil, would be sent to the press in about a month.

The National Institute intends publishing a collection of crusade histories, which are important monuments of the history of the eastern and western countries, from the eleventh to the fourteenth century. Hitherto the histories of the crusades have been related to us only by western authors. But it is equally important for us to know the accounts of the orientals, and to see what they thought of the arrival, stay, customs, and victories of the Europeans, with other particulars respecting those invaders. Camus then proceeded to an account of the manuscripts in the National Library, a work which was begun by the Academy of Sciences, in the year 1785. Their design was to give moderate abstracts of the less important manuscripts, but complete translations of the most valuable, and, in some cases, the manuscripts themselves in their original languages.

The Academy had appointed eight commiſſioners, of whom three undertook to examine the Oriental manuſcripts; two, thoſe in Greek and Latin; and three, thoſe of the middle ages. Thoſe commiſſioners had publiſhed four volumes of "*Notices des Manuſcripts de la Bibliotheque du Roi.*" This work, ſo auſpiciouſly begun, is now carried on with all poſſible zeal, and the buſineſs appears to be of the greater concern, as the number of manuſcripts in the National Library is conſiderably augmented by others brought hither from Italy, Flanders, and Germany, and from the libraries of emigrants, and aboliſhed cloiſters. The Inſtitute has particularly in view ſuch manuſcripts as concern the ſciences, arts, hiſtory, and geography. The Arabian and Perſian manuſcripts which relate to aſtronomy, geography, and hiſtory, are to be firſt publiſhed. The Arabians have undoubtedly a number of important and uſeful aſtronomical obſervations, the compariſon of which with modern aſtronomy will be a great

great acquiſition. Nothing is wanting but a good tranſlator, who can comprehend the true meaning; it being a great diſadvantage if the orientaliſt be not an aſtronomer, or if the aſtronomer be not a complete orientaliſt. Camus reported, that conſiderable progreſs had been made in the impreſſion of the firſt volume of the new collection of manuſcripts, being the fifth of the whole collection. It contains an account of Oriental, Greek, Latin, and French manuſcripts, concerning natural and civil hiſtory, morals, and the arts; and will afford conſiderable knowledge reſpecting the ſciences of the twelfth, thirteenth, and fourteenth centuries. Specimens of the original manuſcripts, in their reſpective characters, are to be printed in this volume, which will make it an important acquiſition to palæography.

Camus next proceeded to give an account of the arts and manufactures, which the National Inſtitute had cultivated in obedience to an order of government, of

the 15th of Germinal, ſecond year. From the printed programma, which is diſtributed at the public meetings, it appears, that the former Academy of Sciences had either written, or extracted from the writings of others, eighty-ſeven memoirs on arts and manufactures: whereas thoſe which the National Inſtitute have either cauſed to be written on the ſame ſubjects by its members, or have received from others, amount to no fewer than two hundred and ninety-ſeven, which are alphabetically arranged. This circumſtance is a proof of the induſtry and attention with which technology has been purſued by the Inſtitute. Among the principal memoirs there are ſome on ſubjects altogether new, ſuch, for example, as thoſe on aeroſtatics, or the method of conſtructing and managing air balloons; on the art of conducting and maintaining fire; on the art of erecting conductors of lightning; on tachygraphy, or a ſecret method of writing by ſigns of abbreviation; and on telegraphy, or the con-

conſtruction of telegraphs, and the ſignals which accompany them. I might mention various other articles, not immediately reducible to the head of arts and manufactures, ſuch as the projection of maps and charts, ſurveying and planning, pharmacy, and the method of making anatomical preparations. In concluſion, Camus mentioned the admeaſurement of the arc of the meridian, through the whole extent of France, from Barcelona to Dunkirk, and the weights and meaſures founded on that admeaſurement by the commiſſioners of the Inſtitute, in conjunction with the foreign commiſſioners, who had come to Paris for that purpoſe.

Extracts from the memoirs, at the particular meetings, preſented to the Inſtitute, during the laſt ſix months, were then read by ſeveral members. It is natural to ſuppoſe, that they ſelected ſuch pieces as appeared to be the moſt important and intereſting. Cuvier read a deſcription of portions of ſkeletons found in quarries, in the country

try about Paris, and particularly at Montmartre. It ſo happened, that he had collected ſuch a number of bones, as to be able to compoſe the complete ſkeleton of an animal. He believed that it formed a new ſpecies, which ought to be placed between the rhinoceros and the camel; but this is the only animal, known at preſent, which belongs to it. Dr. Deſſartz ſhewed that the ſmall-pox, which then generally prevailed, would become leſs fatal, by preparing the children with jalap and certain mercurials.

Bougainville, the celebrated mathematician and circumnavigator, read an hiſtorical detail of ancient and modern voyages towards the north pole. He made a compariſon between the ſituation of ſailors in a naval engagement, and on a voyage of diſcovery. He touched on the voyage of La Pérouſe, and the naval engagement on the coaſt of Egypt, with much elegance and patriotic zeal. The whole of his memoir was ſo exceedingly engaging, that I cannot

do

do leſs than preſent the reader with the following quotation.

"In modern times, the deſire of diſcovering new countries has conſiderably increaſed. The immortal Cook has contributed more to nautical geography than all his predeceſſors, in this purſuit; and thoſe who follow him every where find inſtructive remains of his ſteady and exact courſe. Cook and Magellan! Ah, why ſhould the ſame fate envy you both, and deprive you of living to receive the gratitude and eſteem of your fellow citizens!

"On this occaſion, I muſt be permitted to draw a compariſon between the ſituation of a ſailor in a ſea-fight, and that in which he is placed when ſailing in queſt of new diſcoveries. In a ſea engagement, the mariner is rouſed to action, and encouraged by many circumſtances, by the neceſſary preparations, by the example of others, and by multitudes of ſpectators; and one day of impending danger is ſucceeded by hundreds of others which, through the flatter-

ing

ing medium of ſelf-love, afford a pleaſing recollection of paſt dangers. Naval engagements happen in the midſt of friends and acquaintances, and wreaths of laurel crown the urns, in which the aſhes of the dead are piouſly depoſited. The ſituation of a ſailor who plows the main for new diſcoveries is totally different: in the midſt of conflicting elements, he has to contend perpetually with the moſt ſerious dangers. He muſt at every inſtant, for days, and months, and years, poſſeſs himſelf with cool and unſhaken reſolution: and he is always ſenſible that, after a long ſeries even of ſucceſsful efforts, it may happen, that the particulars of his labours may be as little known as the track which his ſhip deſcribed in the ocean. Oh, that we knew whither to direct our courſe in queſt of the famous La Pérouſe!

Nudus in ignota, Palinure, jacebis arena!

"But I cannot cloſe this digreſſion, on the comparative ſituations of mariners, without

without publicly expreſſing my eſteem for your naval combatants, ſome of whom performed with me their firſt expedition! 'Tis true, they have had to contend againſt an inſulting ſuperiority, and an inconceivable diſadvantage of ſituation. By this proof, however, of their heroiſm and valour, they have acquitted themſelves of their duty to their country, and they ſhall be avenged. They fell fighting, and by thus giving to their enemies a conteſted victory, though not till they had been mortally wounded, they have given us reaſon to believe that they only wanted a prolongation of life to have claimed the victory themſelves."

Theſe ſentiments are all juſtly conceived, and well expreſſed. Bougainville's prelection was often interrupted and finally followed by general, loud and ardent plaudits, which were much more reſpectful to him than the trifling marks of approbation, often dictated by mere civility, which were given to the other ſpeakers.

The learned Langlés read a memoir on the

the Arabian language and literature. It is known that the Arabians were men of ſcience and zealous cultivators of the mathematics, particularly of aſtronomy, when all ſcience was baniſhed from Europe, and their literature is intereſting and important. I have to expreſs my concern that Langlé's voice was ſo low and indiſtinct, that a great part of his ſpeech could not be underſtood.

Lacepede read a memoir on the comparative degrees of induſtry and ſagacity obſervable in birds. He diſtinguiſhed them into eight claſſes, according to the ſagacity indicated by the conſtruction of their neſts, which was the criterion he adopted, and he named the birds, which he ſuppoſed ſhould be referred to each of thoſe claſſes. Lacepede, with the advantage of an excellent voice, poſſeſſes much eloquence, propriety, and dignity, and his memoir was received with general approbation and clapping of hands.

Daunou read a programma, written by Roederer,

Roederer, reſpecting the queſtion propoſed by the claſs of moral and political ſcience: "What are the moſt proper principles on which the morals of a people can be eſtabliſhed?" Of ſixteen anſwers given to this queſtion the year before, not one obtained the premium. The ſame queſtion was repeated, with new conditions and limitations, in order to give the authors an idea of the neceſſary reply, in which all the former candidates had failed.

The celebrated Fourcroy read an extract of a memoir on the analyſis of human *calculi*, together with an account of ſome experiments made to ſolve them, after being extracted out of the bladder. The memoir was excellent, and admirably delivered.

Bitaubé was to have read an account of the opinions of the philoſophers of the ancient republics, but was prevented by want of time, added to his great age and low voice.

Ducis delivered a beautiful poem, abound-

ing

ing with enthuſiaſtic encomiums on the fine arts, and the admirable performances of the French painters, Taillaſſon, Vincent, Regnault, Vien, and David; and with this piece, concluded this truly great and intereſting meeting.

I was alſo preſent at another general meeting on the 15th of Nivoſe, 7th year, or the 4th of January, 1799. Lainée then read an account of the labours of the moral and political claſs, and Andrieux of the claſs of literature, and the fine arts. After mentioning the conqueſt of Naples, he concluded with expreſſing a wiſh that it might not be long before the muſeums of Portici ſhould be brought to Paris. Villars ſtated the reaſons why the ſame claſs again propoſed the prize eſſay: "On the means of cauſing the Latin and Greek languages to be more aſſiduouſly cultivated in France."

Lefevre-gineau read a report of the mathematical, and Laſſus of the phyſical, labours of the claſs devoted to thoſe purſuits.

They

They alſo gave an account of the National Inſtitute at Cairo, and of their meetings and tranſactions, according to the notices which had been communicated to the National Inſtitute at Paris. The tranſactions of the phyſical claſs were particularly intereſting.

L'Heritier, who is acquainted with, and on many accounts highly eſteems, the induſtrious Wiborg, preſented a deſcription of two new *genera* of plants, namely, the *Bruguiera*, and the paraſitical plant, *Rhizodendrum*. The firſt was diſcovered at Madagaſcar by Bruguiere. Michaut has ſeen a tree named the *Robinia viſcoſa*, from North America, which has on its branches, when in vegetation, a black and ſtrongly glutinous ſubſtance. Vauquelin has examined it, and found it altogether different from every vegetable production hitherto known; but it nevertheleſs approaches nearer to reſin than to any other ſubſtance. Cels and Ventenat have ſhewn, that this tree belongs to a *genus*, deſcribed by Juſſieu

and

and Lamarck. Desfontaines has ſent to the Inſtitute a complete Flora of Mount Atlas. Brouſſonnet, who has long reſided in Africa, has particularly deſcribed the proceſſes uſed at Fez and Tetuan, in preparing and dying Turkey leather, and has given an account of the plants employed for that purpoſe. Lamarck has formed a claſſification of ſhells, after a new ſyſtem and characters. Linnæus had only ſixty *genera*; but Lamarck has extended them to one hundred and ſeventeen, by which he ſuppoſes the claſſification of ſhells will be more certain and better determined than formerly. Fourcroy and Vauquelin, by ſome experiments on urine, have diſcovered a particular animal ſubſtance which gives it the property of very readily forming ammonia; yet they look upon their inveſtigation of the properties of that fluid, as very far from being complete.

I now proceed to the memoirs which were read at this ſolemn meeting. Palliſot Beauvois read a memoir concerning ſerpents

pents in general, and mordaceous ones in particular. That gentleman has had nine ſuch ſerpents in his hand, without receiving the leaſt injury; and he aſſured us that they bite animals only when trodden upon.

Peyre, the architect, ſhewed the danger of fire to which the National Library was expoſed, from its vicinity to the great French opera, the National Treaſury, and many private houſes in Rue de la Loi, formerly Richelieu, and other adjoining ſtreets. He admitted that every poſſible precaution had been taken; but that the moſt proper and certain method would be, to remove, if poſſible, this incalculable treaſure of literature to a building ſituated in an open and free ſpace. Ducis read a poetical epiſtle, ſhewing that The Horrible and The Graceful ſhould never be united the fine arts.

Buache, the geographer, deſcribed certain diſcoveries which ſtill remain to be made in the ocean. He had taken extracts from all the old voyages hitherto publiſhed

and

and known; and he had compared the old ones with thoſe of more modern date, in which the latitudes and longitudes are accurately determined, as they are in the voyages of Anſon, Byron, Carteret, Cook, Bougainville, Kerguelen, and La Pérouſe. As the ſituations of the coaſts, countries, and iſlands, deſcribed in the old voyages, do not agree with the modern ones, Buache has been led to ſuppoſe that they are ſtill to be diſcovered. But againſt this opinion ſeveral objections may be made.

Teſſier, the phyſician, read a memoir wherein he attempted to determine the various durations of pregnancy in certain animals; for example, in the bitch, the mare, and the cow. He was of opinion, that the pregnancy of women could not continue longer than ten months; a circumſtance which deſerves the attention both of the phyſician and the legiſlator.

Colin d'Harville cloſed the meeting with a very elegant poem on the travels of Melpomene and Thalia, or the hiſtory of tragedy

gedy and comedy, among the Greeks, Romans, and French, from the earlieſt times. The only Engliſhmen he noticed were Shakeſpeare and Addiſon; but on the German, Spaniſh, and Italian dramatic writers, he was totally ſilent. The ſtile of his firſt canto, the ſubject of which was tragedy, was marked with appropriate grandeur and dignity, and that of the ſecond on comedy, with ſuitable vivacity and eaſe. Both were delivered with maſterly art, and received, eſpecially by the ladies, with great approbation.

I have already mentioned, that the claſs of literature and the fine arts had propoſed for the eighth year the following ſubject: "To point out the means of cauſing the Latin and Greek languages to be cultivated in France, more zealouſly than they are at preſent." The premium offered, is a medal of eight hectograms, or about twenty ounces, of gold. The ſame claſs have alſo propoſed a premium, of the ſame value, for ſolving this queſtion: "To in-

quire, To what degree, the French language has acquired perſpicuity and elegance, and loſt its natural ſimplicity and energy, from the time of Amyot to the preſent day?"

The mathematical claſs have ſelected the important and very difficult problem of the comet of 1770, which may be conſidered as an aſtronomical enigma. The Academy of Sciences, in the year 1794, offered a premium for the calculation of this comet, and the aſtronomers have attempted to bring their obſervations to correſpond with a parabolic curve.

Proſperin and Pingré have been particularly engaged on this ſubject, which has alſo been proſecuted by Du Sejour. But they could not bring a parabolic curve to agree with the obſervations nearer than within a degree, which is by far too wide of the truth. Lexell found that the obſervations could be repreſented with tolerable exactneſs by an ellipſis, which the comet might be ſuppoſed to deſcribe in

five

years and a half. But in this caſe, the ſame comet muſt have been often ſeen; yet it has not appeared either before or ſince 1770. In order to account for this remarkable phænomenon of our ſyſtem, the National Inſtitute have propoſed to aſtronomers, 1. To examine all the obſervations which can be found reſpecting the comet of 1770. 2. To enquire minutely whether or not thoſe obſervations can be reduced to a parabola, or any other curve, whoſe ordinates are referable to an immoveable axis. 3. If it be found that this is poſſible, then to determine the properties of the curve, which correſponds the neareſt to the obſervations. Solutions muſt be ſent in before the 15th Meſſidor, eighth year, or the 3d of July, 1800. The premium is a kilogram, or ſomething more than 2lb. of gold. But the queſtion is ſo very difficult, will require ſo much penetration and labour, and involves ſuch an incredible number of calculations, that, upon the whole, it deſerves a greater premium; ſuppoſe from

ſix to ſeven hundred dollars, or from one hundred and fifty to one hundred and ſeventy-five pounds ſterling.*

The firſt volume of the Memoirs of the National Inſtitute was publiſhed on the 1ſt Vendemiaire, 7th year, or the 21ſt of September 1798, and printed by Baudoin, under the title of "*Memoires de l'Inſtitut Na-*

* Certainly the laſt would be a very moderate, not to ſay an inadequate, reward for the *mere time and trouble*, which the ſolution of ſuch a problem would require; even conſidering the ſuperior value of money in France, and the ſmall price of *ſcientific* labour in this country. I ſpeak from ſome experience, having aſſiſted my worthy friend, the truly learned and ingenious Mr. W. Cruickſhank, formerly ſurgeon of the Naval Hoſpital, Barbadoes, now of the Artillery Hoſpital, Woolwich, in obſerving the path, and determining the orbit, of a comet, which appeared in the weſtern hemiſphere, in the year 1784. Though then in a climate and in ſituations very unfavourable to ſuch purſuits, we brought our calculations and conſtructions to ſuch ſatisfactory reſults, that we had thoughts of offering them for publication in the Philoſophical Tranſactions. But, after our return to this country, in 1786 we found that our deſign had been anticipated, by an ingenious Frenchman, in the *Connoiſſance des Temps*. *Tranſlator.*

tional des Sciences et Arts. Sciences Mathématiques et Phyſiques, 1 *tom.*—*Sciences Morales et Politiques*, 1 *tom.*—*Littérature et Beaux Arts*, 1 *tom.*" In all, three quarto volumes, with twenty-four plates; price on common paper, thirty-nine francs, on ſtrong paper, ſixty francs, and on vellum paper, ſeventy-two francs.

It is ſingular that Boudoin refuſes to ſell the memoirs of each claſs ſeparately; but obliges the purchaſers to take all the three volumes. I could not perſuade him that he loſt, inſtead of gaining, by this method. The volumes of the mathematical and phyſical claſſes are chiefly confined to natural hiſtory, chemiſtry, and medicine. There are only two mathematical memoirs, one by Laplace, and the other by Lalande; for the mathematical members of the National Inſtitute publiſh their works themſelves. Thus Lagrange has lately given the world two important works, namely, his "*Théorie des Fonctions Analytiques*," and "*Reſolution des Equations Numériques*;" nor is it long ſince Laplace publiſhed, "*Expoſition du*

Syſteme du Monde." This work appears to be an introduction to his *Traité de Méchanique Céleſte*, in two volumes, which contains the diſcoveries and opinions of this great mathematician, in the theoretic and higher parts of aſtronomy.

Newton laid the true foundation * of our

* Newton not only "laid the foundation," but ſo greatly advanced the noble ſuperſtructure, as to have left his ſucceſſors little more to do than to follow his rules. "After all the cultivation of dynamics by the commentators and followers of Newton," ſays one of the ableſt of them, "after the *Phoronomia* of Hermann, the *Mechanica* of Euler, the *Dynamique* of D'Alembert, and the *Méchanique Analytique* of *De la Grange*, which are undoubtedly works of tranſcendant merit and utility, the *Principia* of Newton ſtill remain the moſt pleaſing, perſpicuous, and elegant ſpecimen of the application of mathematics to the ſcience of *Univerſal Mechanics*, or what we call *Dynamics*." Encycl. Britann. Suppl. article *Dynamics*, § 103. If this article came, as I believe it did, from the pen to which the Encyclopædia Britannica owes many of its beſt ſcientific articles, the weight of the opinion juſt cited, will be much encreaſed; for the gentleman alluded to paſſed many years on the continent, in habits of intimacy with mathematicians and philoſophers of the firſt order, and is not altogether free from a bias

our knowledge concerning the order and diſpoſition of our ſyſtem, and the motion of the planets in their reſpective orbits. Laplace has finiſhed this beautiful fabric and, with infinite ſagacity, has, by help of the higher analyſis, in which he is ſo diſtinguiſhed a maſter, clearly proved, that all the motions and phænomena in the planetary ſyſtem can be explained, determined, and calculated by the principle of univerſal gravitation, which was not before, in every reſpect, completely effected.

Laplace is at preſent engaged on the mechaniſm of the planetary ſyſtem, and I have ſeen about half of the firſt part already in print. Dr. Burchardt, of Gotha, who ſtudied aſtronomy under Lalande, tranſlates every ſheet, as faſt as it is printed, into German; ſo that the German tranſlation will appear at the ſame time with the French original.

bias in their favour. Such at leaſt was the general opinion, when I had the happineſs to attend his admirable lectures in Edinburgh. *Tranſlator.*

Boſſut,

Boſſut, already well known for his mechanics, ſtatics, hydrodynamics, &c. has lately publiſhed; "*Traité de Calcul différentiel, et de Calcul intégral, en* 2 *tom.* 8vo.

Prony has juſt publiſhed in 4to. "*Expoſition d'une Méthode pour conſtruire les Equations indéterminées, qui ſe rapportent aux Sections coniques.*" He is beſides occupied on a third volume of his very reſpectable work, "*Nouvelle Architecture Hydraulique,*" and on the elements of the mechanical ſciences. Legendre, who formerly wrote "*Elémens de Géométrie*; *Memoire ſur les tranſcendantes elliptiques*; and *Diſſertation ſur une Queſtion de Baliſtique, couronné par l'Académie de Berlin,*" has lately publiſhed an excellent work in quarto, intitled, "*Eſſai ſur la Théorie des Nombres.*

Lalande is engaged on a complete *Bibliographie Aſtronomique.* Beſide the profound and enlarged views of this gentleman in aſtronomy and its kindred ſciences, he is a great literary character. His extenſive reading and correſpondence have furniſhed him with details from every country;

country; so that a complete account of the astronomical writers and literature, of all nations, may be expected from his pen. I have communicated to him all that I could collect on this subject in Denmark.

Messier is continually occupied in discovering comets, and calculating their paths. Delambre and Mechain have measured nine degrees and a half of the meridian of the observatory of Paris, and which stretches quite through France, from Barcelona to Dunkirk. Delambre has been employed on an important work, which he laid before the Commission for weights and measures, under the title of "*Méthodes analytiques pour la Détermination d'un Arc du Méridien*," and which is now in the press.

Borda, though aged, infirm, and consumptive, still labours as much as his health will permit. He is now engaged on a manual of tables of logarithmic sines, after the new centesimal division. I saw at his house, several printed sheets of those tables; but he complained that, on account of the want of good and uniform paper in France,

the

the impreſſion proceeds but ſlowly. The ſines and tangents are to be found in the ſtereotypic edition of Callet's tables (Paris, 1795) but not divided into centeſimal minutes. Borda's edition will be much more complete, and at the ſame time more uſeful. He has alſo diſcovered, this winter, ſome improvements, and new conſtructions of the barometer and dipping compaſs. Both theſe inſtruments are to be executed by that able maker Le Noir. The principal improvement in the dipping needle is, that its axis turns in a glaſs cylinder or tube. I had formed the ſame idea many years ago, and have ſince had a compaſs ſo conſtructed, which I have deſcribed in the Memoirs of the Copenhagen Academy of Sciences, fourth part of the new ſeries, which contains a drawing of this inſtrument, and an account of the obſervations made with it.

As another probable cauſe of the paucity of mathematical memoirs in the firſt volume of the Tranſactions of the National Inſtitute, it may be remarked, that moſt of the members of this claſs are lecturers in the

the Polytechnic and Mineral Schools, and other inſtitutions, and that the journals publiſhed by thoſe ſeminaries contain many of their memoirs, which is the caſe with Lagrange, Prony, Lefevre-gineau, Briſſon, Hauy, and others.

The writings of the old Academy of Sciences were divided into two parts, *Hiſtoire* and *Mémoires*. The firſt contained an hiſtorical account of its proceedings, and extracts from the minutes; and the other, the memoirs themſelves. Since the organization of the preſent National Inſtitute, no part of its hiſtory is admitted into its writings; but, in the general meeting at the cloſe of the year, a particular account of its proceedings is delivered by the Preſident of the Inſtitute, to the Preſidents of the Council of Five Hundred, and the Council of Ancients, who reſpectively reply to the ſpeech made by the Preſident of the Inſtitute. One of theſe reports, or accounts of the Inſtitute, is intitled, "*Compte rendu et préſenté au Corps Légiſlatif, le premier jour complémentaire l'an* 4, *par l'Inſtitut National*,

National, contenant l'analyſe des travaux pendant l'année 4me." Similar accounts have been publiſhed, for the 5th and 6th years.

In all that I have ſaid of the members of the National Inſtitute, in this and the preceding letters, my readers will obſerve that I have always mentioned with warm commendation and becoming reſpect, thoſe who are eminent in their reſpective purſuits, and that I conſider the National Inſtitute of France, as being one of the moſt important learned ſocieties in Europe. If I ſhould think or write otherwiſe, I ſhould look upon myſelf as deſtitute of all underſtanding. Hence I was the more ſurpriſed, when, after my return home, I found it ſignified, in the *Décade Philoſophique littéraire et politique, An.* viii. 30*me. Pluvioſe, No.* 15, *p.* 372, that in my letters to Copenhagen, I had uniformly reviled the Inſtitute, held it up to ridicule, and depicted it in the darkeſt colours.

I need make no obſervation on the meanneſs of ſlanderouſly miſrepreſenting the corre-

correſpondence of an individual with his friends, merely to find, or make, a pretence for complaint; ſince ſucceſs in perſuading people to believe his aſperſions ultimately fixes a ſtigma on the calumniator himſelf. But I do hereby deny my having ever written a ſyllable with which the members of the National Inſtitute, either individually or collectively, could be offended; and I challenge any perſon whatever to produce a letter from my hand having that tendency. In compliance with the advice of my friends at Paris, I have made no reply to any of thoſe libellers. My friends know that their aſſertions are untrue, and thoſe who are not acquainted with me will be convinced of their falſhood by the publication of my travels. On this diſagreeable ſubject I have been hitherto ſilent; and have looked upon my puny aſſailants in the *Décade Philoſophique*, with that contempt which they deſerve.

CHAP. XV.

THE AEROSTATIC SCHOOL IN MEUDON—FRENCH MONUMENTS.

The Aeroſtatic School at Meudon—Eſtabliſhment, Officers, Pupils—Deſign of this Inſtitution—Conté, his Invention—Aeroſtatic Soldiers—Materials of which thoſe Air Balloons are compoſed—Mode of filling them—French Monuments—Such as eſcaped the Fury of the Populace, ordered to be collected and depoſited in the ſmall Auguſtine Monaſtery—Saloons ſet apart for that Purpoſe—Claſſification, Taſte, and Induſtry of Lanoir—Monuments of Kings, Queens, Stateſmen, Warriors, Men of Letters, &c.—Statues in Marble, Bronze, &c.—Names of the Artiſts who deſigned and executed them—Some of them the boldeſt and happieſt Efforts of Genius—Inſcrip-

—Inſcriptions—Annealed Glaſs—Painting on Glaſs—Churches, &c. whence they were taken—Several mutilated Pieces of Art reſtored—Reflections on the Whole.

THE Aeroſtatic School in Meudon was eſtabliſhed by a decree of the Committee of Public Safety, the 31ſt of October, 1794. This ſeminary conſiſts of director, ſub-director, a ſecretary, a magazine-keeper, and ſixty pupils, who are inſtructed in all that relates to the aeroſtatic ſcience, eſpecially ſuch parts of it as may be directed to military operations. There are two rooms ſet apart in the old caſtle, for the conſtruction of the air balloons, with all the apparatus neceſſary for that purpoſe. The pupils, with Conté the director, lodge in the new caſtle. M. Conté is an able phyſician as well as a chemiſt: he cannot be too highly praiſed for his unremitting attention to the regulations and management of the School. He is well known

for his inventions, ſuch as the aeroſtatic telegraph, and his factitious black lead pencils, which are brought to ſuch a degree of perfection, as to rival the beſt in England: they are not prepared from the native ore, but a compoſition which conſiſts, as far as I have learned, of iron and ſulphur.

The balloons in Meudon are made of a peculiar kind of thick taffety, wove for that purpoſe. When ſewed they are varniſhed over: ſo that the pores are cloſed in ſuch a manner as to prevent the evaporation of the gas in a very conſiderable degree, which is the reaſon that thoſe balloons hold the hydrogen, or inflammable air, many months; whilſt others that are not prepared in the ſame manner are found to be exhauſted in a few days. To the improvement of the gas, M. Conté has not a little contributed to the manner of filling the air balloons. The mode is to erect a ſmall furnace, through which ſeveral large iron pipes paſs (commonly from four to ſix,) which

which are filled with iron filings. The ends of these tubes extend out of the furnace, and are furnished with a cock, which may be opened or shut at pleasure. A smaller tube is joined to the end of these pipes, and is then inserted in the lid of the copper or vessel, half filled with water, and so air tight that the steam can only find its way through the red hot tubes in the furnace. From the opposite end of these red hot tubes, which run out of the furnace, a small tube goes into the vessel, which is filled with a solution of caustic lye, or alkali, and then it passes to the tube which conveys the hydrogen gas into the balloon.

The whole apparatus, cauldron, furnace, &c. may be erected and worked in two days. A balloon of about thirty feet diameter may be filled in two or three days. When a balloon of this size is newly filled, it will carry up a weight of 2000 pounds, and twenty men at least. In two months it loses so much by evaporation, that it will

only bear 500 pounds, and ten men. I have ſeen the experiment tried in the Champ de Mars on the feaſt of the New Year, in the ſeventh year of the Republic. Such balloons are always found ready filled on the terrace at Meudon, where they ſtand in the open air without receiving any apparent injury, in conſequence of the peculiar texture of the taffety, and the excellence of the varniſh. The upper part was covered with a coat or caſe of fine leather, from whence the ropes deſcended, to which the car was attached. All theſe military balloons are tied together, and aeroſtatic ſoldiers taught to manage them.

In mild or ſerene weather a number of theſe ſoldiers aſcend, always accompanied by an officer or ſubaltern. Two companies of aeroſtatic ſoldiers are always quartered at Meudon. Each conſiſts of one captain, two lieutenants, two ſerjeants, two corporals, one drummer, and forty privates.

The little Auguſtine monaſtery, now ſhut up,

up, contains a collection of French monuments. The decree of the National Convention to abolish every vestige of royalty, or any thing that might recal the days of feodality, was considered as the signal for desolation, plunder, and rapine over all the kingdom of France. The statues of kings and others without distinction were hewed down and levelled with the dust. The noblest and happiest efforts of the pencil were rent in pieces, and scattered in the air. Entire series of the most precious medals, the labour and research of ages, were stolen or consigned to the crucible. All the monuments and epitaphs within reach of the hand of fury, were broken to pieces. The greatest part of the labours of the first artists, collected in different parts of the world, shared the same fate. The Vandals and barbarians, who rather resembled the furies let loose from hell, than human beings, vented their ungovernable rage on the choicest productions of taste and ge-

gius. In the Convention and Revolutionary tribunals, the moſt profligate and abandoned boaſted of the revenge which they took on the arts. The enlightened Gregoire ventured at length, at the riſk of his life, (leſt he ſhould be accuſed of being attached to the old ſyſtem) to ſtand forward as the advocate of the Muſes. On the 31ſt of Auguſt, 1793, he addreſſed a letter to the Convention, in which he painted in the moſt natural and lively colours, the irruption of this vandalic horde into the ſanctuaries of ſcience, and the exceſſes which they committed on monuments that lent immortality to mortals. This eloquent epiſtle at firſt had little effect: at length, however, the Convention began to think of converting the public monuments to national property. For this purpoſe they ordered them to be collected and depoſited in the ſmall Auguſtine cloiſter. This injunction, however, was attended with little effect, as may be collected

lected from the commiſſion of public inſtruction, decreed, the 20th of October, 1795, which enacted, 1ſt, that a muſeum ſhould be erected for the conſervation of the French monuments; 2dly, that no perſon ſhould dare to carry away or deſtroy any of the public monuments; and, 3dly, that the propoſal of Lanoir, inſpector of the muſeum, reſpecting the erection of the ſaid muſeum ſhould be taken into immediate conſideration.

The propoſal of this ingenious gentleman was acceded to, and the ſums neceſſary to carry the ſame into execution, were voted. Lanoir began without delay to arrange and repair the mutilated ſtatues, &c. with unremitting induſtry, at as little expence to the public as poſſible. The general plan of claſſification is to arrange the ſtatues, &c. in centuries in ſaloons decorated in the taſte of each age. Three ſaloons are already devoted to this purpoſe, viz. the thirteenth, ſixteenth, and ſeventeenth centuries. Theſe ſaloons are ex-

tremely neat, ſome of the ſtatues are raiſed on pedeſtals, and others placed againſt the wall. The monuments thus arranged, and erected in the three ſaloons, amount to upwards of two hundred.

I ſhall now give a ſhort deſcription of theſe monuments. The firſt collection is the Grecian antiques, twelve tomb-ſtones of fine marble, with Greek inſcriptions and bas-reliefs, ſome ſtatues taken from Richelieu's garden, and amongſt the reſt a highly finiſhed Bacchus, as large as life, with his thyrſis in one hand, and a bunch of grapes in the other, and Meleæger in the chace. They are fine ſtatues of Parian marble. Thoſe antiques in all amount to twenty-ſix in number. Of Celtic monuments there are four altars, three ſides are bas-reliefs, repreſenting an offering, on the fourth ſide is the following inſcription

Tib. Cæſare
Aug Jovi optumo
Maximo - - - M.
Nautae Pariſiaci
Publice poſierunt

This inſcription probably means, that the Pariſian ſeamen who had ſailed down the Seine, raiſed this altar to the honour of Tiberius.

Of the monuments of the middle age there is a ſtone coffin, or ſarcophagus, of greyiſh ſtone, rudely hewn, which contains the remains of King Dagobert, alſo a monument for Childebert, and another to the memory of Fredegunde, Chilperic's queen, and another to Mary, in wood.

The ſaloon ſet apart for the monuments of the thirteenth century is already completed. The dome is vaulted in the Gothic ſtyle, with a blue ground, ſtudded with gilt ſtars, the ſharp pointed bows or arches ſupport each other, ornamented with roſes according to the taſte of the day. Two of them repreſent the Evangeliſts, which were taken from St. Victor's church. Sepulchral lamps are ſuſpended from theſe roſes, the doors and windows are rib formed, they are compoſed of the remains of a monument in St. Denis. The panes of the

windows are in the Gothic taſte, and taken from a cemetery which Montreau, the famous architect, had raiſed to himſelf in 1250. This ſaloon, in my opinion, is very properly lighted with feeble rays.

In this repoſitory, whoſe *tout enſemble* has a good effect, are contained twenty-eight monuments. Amongſt others there are the cenotaphs brought from St. Denis for Clovis the Firſt and Second. Martel, Pepin's father, Pepin and his queen Bertha, Charles the Bald, Hugh Capet, Philip the ſon of Louis the Sixth, the queen of Louis the Seventh. Figures are placed over all theſe cenotaphs. The ſon of Louis the Ninth, and a child a year old, have a monument of wood, covered with enamelled copper. There are different ſtatues beſides, ſuch as that of Louis the Ninth, and Margaret his queen, Elizabeth, and ſome bas-reliefs. The rudeneſs of the age is viſible in all theſe monuments; ſome indeed evince a greater progreſs in taſte

and

and execution than could be expected in thoſe times.

In the ſaloon, ſacred to the 14th century, there are thirty-eight monuments, moſt of which were erected in St. Denis to the memories of the Kings of France, ſuch as Louis the Tenth, Philip the Fifth, Philip of Valois, Charles the Fifth. The figures are almoſt all of marble. On the monument of William Chanac, Biſhop of Paris, taken from St. Victor's church, is the following inſcription:

Hic ſitus eſt Dominus G. de Chanac, patriarcha
Alexandrinus, juris dum viveret arca.
Mores ornatos ad culmen pietatis
Adjungens gratos actus habuit pietatis,
Plebis et Eccleſiæ prælatus Pariſienſis
Cultor juſtitiæ perverſorum fuit enſis
Sancto die crucis in Majo moriens
Anno milleno trecento quadrageno
Octoque, centenos annos peragens qvaſi plenos
Pro dilectoris anima tui dulciter ora
Sancti Victoris conventus qvalibet hora.

In the ſaloon for the fifteenth century there are fifteen monuments, conſiſting of Queens, Princes, Princeſſes, &c. taken from

from the royal cemeteries in St. Denis. I ſhall here tranſcribe a monumental inſcription over Jean de la Porte, in what is called bouts-rimés.

Bonnes gens vous devés
- - - penſer
Qvon doit ſon tems bien dis
Car la mort homme de - porte
Temoing maiſtre Jehan de la
Conciliеatur pour le
- - - roy
Au Chaſtelet et sous des
L'un des eſchuiers en ſa
- - cour
De Paris, ſous d'autrui en
Le quel en terre cy
- - Devant
Gist comme la mort re
Et laiſſa ce monde hi
- - - Deux
Mil quatrecent qvarante.

The ſaloon deſigned for the ſixteenth century is finiſhed with great taſte. Two academic figures, executed by Barthelemy Prieur, are placed over the door. The joints of the door are of yellow ſtreaked marble. The cieling is ornamented with arabeſque, according to the taſte of the times. This hall contains fifty-three monuments.

numents. The monument of Louis evinces that the arts already began to make a rapid progreſs towards perfection. The King's ſtatue, as well as that of the Queen, (Anne) are of excellent workmanſhip. The twelve Apoſtles are arranged in twelve richly ornamented arcades, in which the artiſt has exhibited conſiderable taſte in the ſtyle and repreſentation. In the four corners there are the four cardinal virtues in a natural ſize, the whole reſts on a pediment of black marble, on whoſe edges there are bas-reliefs, repreſenting the victories of Louis the Twelfth. This fine hiſtorical monument has ſuffered much from jacobinic rage. The heads, noſe, arms, and hands, are broken from the figures.

The monument of Renée d'Orleans Longueville has ſix bas reliefs of alabaſter, finely executed. The monument to the memory of Louis Deponchier and his wife, is ornamented with the figures of both, with leſſer ones repreſenting the virtues. The whole is finely executed in alabaſter.

The

The monument of Francis the Firſt is erected in a particular chapel, ſet apart for that purpoſe. The King and his Queen Claudia are repreſented by two marble figures, ſomewhat larger than the natural ſize, extended as dead. The artiſt may be ſaid to have diſputed the prize with nature in the execution of this monument. The privation of life in the countenance and muſcles is finely expreſſed. The pedeſtal on which theſe figures lie is adorned with a bas-relief, repreſenting the victories of Francis, different genii with extinguiſhed torches, allegoric figures, &c. The roof is ſupported by ſixteen fluted columns. Francis and his Queen are grouped on the cieling in their gala robes, together with the two Princes their ſons, and their daughters, all of fine marble. The whole was deſigned by Primatice, and ſculptured by Jean Gougeon. This coſtly monument, the firſt perhaps in France for deſign and execution, formerly ſtood in the church of St. Denis. It ſuffered very much in the

paroxyſm

paroxyſm of popular tumult; but Lanoir has been very ſucceſsful in re-inſtating the fragments, according to the original deſign, which he had copied in his youth, whilſt a ſtudent in works of this kind.

The monument over Henry the Second and his Queen, Catharine of Medicis, is on the eve of being reſtored in the ſame manner, with the addition of four fine figures in bronze, one in each corner, repreſenting the four cardinal virtues. This fine monument is twelve feet and a half in length, ten in breadth, and fourteen in heighth. It was deſigned by Philibert de Lorme. Soon after the demiſe of the King, Catharine gave directions to Germain Pilon, her own ſculptor, to execute it, which he did with great felicity, for it may be called the chef d'œuvre of all the fine works with which he has enriched the empire of ſculpture.

The ſame artiſt alſo executed the three Graces, four feet three inches high. They ſtand on a triangular pedeſtal, and bear an urn, which contains the hearts of Henry

Henry and Catharine. The followlng inſcriptions are cut in the three ſides of the pedeſtal.

On the firſt ſide—

Cor junctum amborum longum teſtatu amorem.
Ante hommes, junctus ſpiritus ante Decem.

On the ſecond ſide—

Cor quondam charitum ſedem cor ſumma ſecutum
Tres Charites ſummo vertice jure ferunt.

On the third ſide—

Hic Cor depoſuit Regis Catharina mariti
Id eupiens proprio condere poſſe ſinu.

Thoſe three figures breathe all the charms of immortal youth and gaiety. They are ranked amongſt the happieſt efforts of Pilon's chiſel.

There are two ſtatues at the feet of Henry the Fourth, both of marble. The firſt was executed by Franchville, and the ſecond by Prieur. In the ſame apartment there are twelve bas-reliefs, two buſts, ſome in marble, and ſome in bronze, with a Madonna in Moſaic work, and two very large

large and fine enamelled figures. Theſe two exhibit the paſſion of Chriſt. The portraits of Francis the Firſt and his Queen Claudia are added to the one, and thoſe of Henry the Second and Diana of Poitiers to the other. They were executed in 1553, by Leonard Limouſin.

The monument over Giu de Faus is worthy of attention. He was Preſident of the Parliament, and employed in many embaſſies under Charles the Second, and Henry the Third. A Latin epitaph ſets forth the principal events of his life; at the end of which are to be ſeen four French ſtrophes or quatrains, which have, as it were, miraculouſly eſcaped the fury of the Jacobins, when inſcriptions leſs calculated to recal the days of royalty fell a ſacrifice to their deſtructive rage. Curioſity on this very account induced me to tranſcribe them, and which I now preſent to the reader:

Il eſt permis ſouhaiter un bon Prince,
Mais tel qu'il eſt, il le convient porter;
Car il vaut mieux un tyran ſupporter
Qve de troubler la paix de la province.

The ſaloon appropriated to the monuments of the ſixteenth century is ready. It is ornamented in the taſte of thoſe days. It contains one hundred and three monuments. Cardinal Berulle's was executed by Jacob Sarrazin and Michael Anguier. This monument is juſtly admired, particularly the bas-reliefs.

The mauſoleum of Cardinal Richelieu was deſigned by Lebrun, and executed by Girardon, and is conſidered as his maſterpiece. The pedeſtal is fourteen feet long, and five feet nine inches broad. The Cardinal's figure is ſix feet high, placed betwixt two female figures, one repreſenting Religion, the other Hiſtory, with two Genii, each two feet and a half high. This mauſoleum did not eſcape in the war that was waged against the productions of genius. Under the medallion of Deſcartes, ſuſpended to a pyramid of black marble, there are two inſcriptions, one in Latin and the other in French.

On Cardinal Mazarin's monument he is repre-

repreſented on his knees, with a genius behind him bearing ſeveral weapons of war. Three figures in bronze are raiſed on the pedeſtal, each ſix feet in height, one repreſents Faith, the ſecond Prudence, and the third Plenty.

There are fourteen fine bas-reliefs on the monument of Henry of Bourbon Condé, they were modelled by Sarrazin, and executed by Perlan and Duval.

The monument of the famous Marſhal Turenne, was executed after a deſign by Lebrun. The groupe in which the Marſhal is repreſented in arms, was executed by Tuby, and the two erect figures, Wiſdom and Courage, by Marſy. Underneath the figure of Turenne, in the centre of a cenotaph, is a bas-relief in bronze, repreſenting the glorious and ſanguinary battle of Turckhum, on the 5th of January 1675.

There are two very neat monuments raiſed to the memory of Colbert and Louvois;

vois ; the two great ornaments and ſupport of the reign of Louis the Fourteenth. Theſe monuments were executed by Girardon, Coyzevox, Tuby, and Desjardins.

A buſt of the celebrated painter Charles Lebrun is placed on a pyramid, with a figure repreſenting Piety. There are two figures, one on each ſide, Piety and Painting: the firſt looks up to the painter, and the other in a dejected attitude deplores the loſs of her favourite. Coyzevox, the faithful friend of Lebrun, who exhauſted all his powers on theſe fine figures. An equeſtrian model in bronze of Louis the Fourteenth, by Girardon, has found a place in this collection. The ſtatue from whence it was made ſtood in the Place de Vendôme, the left foot of it only now remains, which lies by the ſide of the model. Adjoining is a model in bronze, of the ſtatue of Louis the Fourteenth, which ſtood in the Hôtel de Ville at Paris, executed by Coyzevox. There are two marble

ble ſtatues at the foot of this, as large as life, one was executed by Coyzevox, and the other by Michael Anguier.

In addition to theſe, there are thirteen ſtatues of Chriſt, and the Holy Family, of an extraordinary ſize, they were all collected from the pillaged churches in Paris, with ſixteen bas reliefs, ſome in marble and ſome in bronze.

Of buſts, a great number has been ſaved and erected, ſuch as thoſe of Henry the Third, Louis the Fourteenth, and Louis the Fifteenth. Of ſtateſmen and warriors there are fifteen, and amongſt others thoſe of Sully, Mazarin, Richelieu, Colbert, Turenne, and the great Condé, &c. Of learned men, St. Peyreſe, Regis, Quinault, Lafontaine, Moliere, Corneille, Racine, and Boileau. Of artiſts, Mignard Pouſſin, and Leſue, painters; Lenoſtre and Manſard, architects; and Sarrazin and Puget, the ſculptors. A few of theſe buſts are of bronze, and the reſt marble. I alſo obſerved a ſmall piece of Moſaic work, finely executed

executed, repreſenting Saint Hieronymous in the deſert.

There are thirteen monuments already collected, the works of the eighteenth century, excelled by none in correctneſs of deſign, and felicity of execution. Amongſt theſe the following may be juſtly ranked as the fineſt. The monument of Cardinal Dubois; the figure is of marble; it is very fine, and ſufficient of itſelf to immortalize the name of Conſtou, the ſculptor. An allegoric monument of the pariſh prieſt of St. Sulpice, Langnet de Gercy, claims attention; it was executed by Michael Angelo Slodtz.—Death is here repreſented as a ſkeleton in bronze. I cannot approve this mode of repreſenting Death, either in bronze or marble; it is not, in my opinion, ſanctioned by good taſte. The Greeks and Romans never perſonified the King of Terrors in this frightful manner. Death is exhibited in this mode in an open coffin on the monument of Marſhal Harcourt. The Marſhal is endeavouring to caſt his ſhroud aſide,

in order to ſpeak to his wife, who is on her knees by the ſide of his tomb. Her countenance is intereſting, being filled with all that grief can inſpire, brightened up however with the mild ſerenity and reſignation of a pious Chriſtian that looks for immortality, and the rewards of another life. This monument taken altogether is finely executed. The hand may be ſaid to have embodied the thoughts of the ſculptor with a fidelity beyond expreſſion; nor can I paint the impreſſion ariſing from the view of it, a pleaſing melancholy accompanied by a religious and philoſophic calm.

Theſe monuments were all taken from the churches: they were executed by Coyzevox, Van Cleve, Couſtou, Pigalle, Slodtz, Vaſſé, Lemoine, Falconet, and Monnot. There are thirteen bas reliefs in bronze, marble, and wood. The deſigns were taken from ſubjects in the ſcriptures. The buſts and medallions conſiſt of ſtateſmen and generals; the Regent Philip, of Orleans,

Marſhal Aſfeld, Count of Saxony, D'Argenſon, and Monteſquieu. In the learned claſs are Deſtouches, Fontenelle, Aürue, Helvetius, Piron, Belloi, Voltaire, J. J. Rouſſeau, Buffon, Diderot, Gluck, Raynal, Bailly, the famous aſtronomer and hiſtorian, the firſt Mayor of Paris, Vaucanſon, &c. Two neat pieces of moſaic work caught my eye; the ſmaller one repreſents a handful of flowers upon a ground of black marble. The larger is eleven feet long and ſeven broad, and is intended for the ground-floor of the ſaloon, which is not yet ready, but if finiſhed according to the deſign of Lanoir, it will be an additional proof of his refined taſte.

I found here what I little expected, the epitaph of the immortal Winſlow, my countryman, which eſcaped the indiſcriminate fury of the mob. I thought it worth tranſlating:

D. O. M.

D. O. M.

Hic jacet
in ſpem beatæ immortalitatis. JACOBUS BENIGNUS WINSLOW, patria Danus; commoratione Gallus, ortu et genere nobilis, nobilior virtute et doctrina, parentibus lutheranis natus, hæresin, qvam infans imbiberat, vir ejuravit, et adnitente ill. Episcopo Meldensi Jacobo Benigno Bossuetio, cujus nomen Benigni in confirmatione suscepit, ad excelsiam catholicam evocatus, stetit in ejus fide, vixit sub ejus lege, obiit in ejus sinu; vir æqve verax et pius, in pauperis summe misericors, nullaque erroris aut vitii pravitate afflatus. Regius lingvarum teutonicarum interpres saluberimæ facultatis Parisiensis Doctor Regens; illum mædicæ artis et præsertim anatomicæ doctorem et professorem peritissimum regia eruditorum societas Berolini, regi scientiarum academiæ lutetiæ socium communi suffragio elegerunt. Vita excessit V Nonas Aprilis anno Salutis MDCCLX ætatis XCI.

Pio Conjugi et Parenti
uxor et liberi hoc monumentum posuerunt.

I ſhall now give you a ſhort account of the ſtained glaſs. In the depôt of the thirteenth century, there are three large church windows, with panes of painted glaſs, the work of that age. They were

taken from the abbey of St. Germaine des Près, and repreſent moral ſubjects, particularly thoſe of domeſtic life.

In the ſaloon, ſacred to the ſixteenth century, there is a painting of Charles the Sixth, on his knees, upon a large pane, encompaſſed with many ſmaller ones, on pious ſubjects.

In the ſaloon, dedicated to the fifteenth century, there are two very large paintings in glaſs repreſenting paſſages in the apocalypſe. They were painted by Johan Couſins, and another with the portrait of Francis the Firſt, by the ſame inimitable pencil, in the natural ſize. Theſe fine pieces were taken from the chapel in Saint Vincennes: next follow the birth and circumciſion of Chriſt, deſigned by Parmaſons. An Ecce Homo painted by Albert Durer. In the windows of the gallery or corridor there are two and twenty paintings on glaſs, after the deſigns of Raphael, repreſenting the fable of Pſyche. The laſt named

named five-and-twenty-pieces were taken from the Caſtle of Ecouen.

In the ſaloon ſet apart for the productions of the ſixteenth century, there are two panes with deſigns founded on the hiſtory of Saint Gervais and Saint Prolais, Mary's flight to Egypt, two panes in moreſque work. Theſe pieces were executed by Perrin, from the deſigns of Leſuer, and were taken from Saint Gervais. The following paintings on glaſs were taken from the cloiſter of the Feuillants in the ſtreet Honoré. Don Jean de la Barriere, the founder of that cloiſter, in which a chapter was once held. A repreſentation of De la Barriere, in priſon; a precious ſight for the ſuperſtitious. The entry of Henry the Fourth into Paris. Theſe two pieces were executed by Simpy after the deſigns of Elgés.

The ſaloons, which are reduced to order, namely, thoſe of the thirteenth, ſixteenth and ſeventeenth centuries, are very neat and commodious; the fourteenth and eighteenth,

teenth, as yet lie neglected, unleſs we except thoſe that are erected in the court, gardens, paſſages, and rooms of the aforeſaid Auguſtine cloiſter. This promiſcuous heap of warriors, ſtateſmen, knights, men of letters, ſaints, prelates, monks, and nuns, creates an agreeable ſurprize at firſt view; but the contemplative ſpectator finds himſelf immediately diſpoſed to aſk this queſtion, What right has the preſent generation to deſtroy thoſe monuments which their forefathers erected to perpetuate the memory of their relatives or friends. Have they not afforded maintenance and ſupport to many artiſts, and fanned the ſparks of genius and emulation? What muſt the living artiſts think when they ſee the precious works of their maſters expoſed to the caprice of a licentious mob? Have they not ſerious cauſe to be alarmed for the future fate of their own labours, and that a ſingle day may deſtroy the labours of ages? What muſt be their feelings when they

enter

enter any one of the churches which are ſtill open in Paris, ſtripped of their ornaments, the naked walls diſfigured with holes, and the floors on which thoſe monuments ſtood covered with dirt and gravel; what an awful ſenſation, when Reaſon has reſumed her throne, to behold the trophies of the arts thus ſcattered and annihilated!

The celebrated and indefatigable Millin, in the commencement of the year 1792, publiſhed a collection of monuments in four volumes. He had been at great pains and expence in travelling over France, to collect the moſt remarkable either for deſign or execution that the kingdom could boaſt. They were copied and engraved, with great accuracy. He had alſo copied a great number of epitaphs and inſcriptions, which he illuſtrated with many hiſtorical remarks, ſo as to render them very intereſting to the hiſtorian and antiquary. In the month of November 1798, he publiſhed the fifth volume under the title of Antiquités Nationales.

Millin's houſe is the reſort of all men of genius and taſte. It is the only one in Paris where a traveller can form an immediate acquaintance with Frenchmen and ſtrangers. Every ſeventh day in each decade he gives what is called his literary tea. The company begin to aſſemble about eight or nine o'clock. The table in the firſt room is covered with French and foreign journals, and new publications of merit. The inner chamber is occupied by ladies, who play on the *clavecin*, and accompany it with their voice, which has a pleaſing effect, eſpecially in filling up the pauſes of converſation. About eleven the company is treated with tea, punch and cakes, his good mother pays the utmoſt attention to the gueſts, and ſeems highly gratified in rendering them every courteſy in her power. About twelve they all retire.

In thoſe circles I have found thirty and forty perſons at a time. Mr. Millin has a book, in which every traveller writes down his name

to

to enable him to preſerve the remembrance of each. I am glad of this opportunity to return Mr. Manthey, the Daniſh ſecretary of legation, my ſincere thanks for having introduced me to M. Millin, in whoſe houſe I have paſſed many agreeable evenings, and where I had frequent opportunities of forming many valuable acquaintances, which rendered my ſtay in Paris at once amuſing and inſtructive.

CHAPTER XVI.

PRESENT STATE OF THE MANUFACTURES OF FRANCE.

Exhibition of various French Manufactures, Arts, &c.—Watchwork—Artificial Black Lead Pencils—Files—Œconomic ſtoves—Locks--Chemical Productions—Woven and printed Tapeſtry—Earthenware—Steel-work—Silk, Cotton, Linen, Leather, Sealing-wax, Chryſtal Glaſs.—Weights and Meaſures—Stereotypic Printing—Porcelain—Spinning Machines—Mechanical Engravings, &c.

THE two laſt of the complementary days of every year are devoted to an exhibition of the different ſpecimens of French manufac-

manufactures, arts, and handicrafts, which are expofed to public inſpection, in a large building raiſed on porticoes or arches, in the Champ de Mars, oppoſite to the directorial amphitheatre. On the evening of the third complementary day, the miniſter of the interior, with the officers of the central bureau, reported the names of a jury appointed to examine, ſelect, and pronounce on the beſt ſpecimens in manufactures, arts, &c. which are depoſited in thoſe arcades for that purpoſe. As I have enjoyed a great deal of pleaſure in loitering through thoſe arcades, I ſhall preſent a ſhort account of their contents:

1ſt Arcade. A pendulum which ſtrikes decimal ſeconds, and ſhews the new diviſions of time; the days are divided into ten hours, the hours into a hundred minutes, and the minutes into a hundred ſeconds. This was executed by Conturier. On my return home, I chanced to alight on a watchmaker, in Colding, who had made a

watch according to this new diviſion of time. In the ſame arcade I ſaw a group of figures in porcelain, repreſenting Meleager and Atalante. I alſo ſaw ſeveral ſpecimens of plated work, executed by Patoulet, Andre, and Lebeau, in the department of the Seine and Oiſe. I cannot ſay that I ſaw any thing in this arcade, that ſtruck me as peculiarly excellent.

2d Arcade. Breguet, the famous watchmaker, has diſcovered a new *echapement* which is propelled by a conſtant and uniform force. This is a very lucky invention, and combines many advantages. Bruns, a carpenter, furniſhed many pieces of beautiful inlaid work in the cabinet line.

3d Arcade. Fine razors, forged of ſteel, made in Clouet's new manner.

4th Arcade. Black lead pencils of different kinds, for deſigning and drawing lines, by Conté. They were of a peculiar compoſition, and ſuperior to thoſe of England.

5th

5th Arcade. Different kinds of files, coarſe and fine: they appeared to be very well finiſhed.

6th Arcade. Deſarnod's healthy and economic ſtoves, which are formed ſo as to conſume a ſmall quantity of fuel, and yet warm the room ſufficiently. The leaſt claſs of thoſe ſtoves or furnaces is twenty-four inches in height, twenty-one inches in breadth, eighteen inches long, and weigh four hundred and fifty pounds each. The middle claſs is thirty inches in height, twenty-ſix in breadth, and twenty-one in length, and weigh eight hundred pounds each. The largeſt is thirty-ſix inches in height, thirty-one in breadth, twenty-four in length, and weigh thirteen hundred and fifty pounds each. They were all of caſt iron.

7th Arcade. Different locks and ſcales made in Rock, Tague, and Pont Londry. I could not diſcover any peculiar excellence in them.

8th Arcade. Some of the chemical and mineralogical productions of De la Place.

A chemical

A chemical furnace by Boummaiel, foreman or melter to Salneuve; neither appeared to be of any great value.

9th Arcade. Several planetariums by Ruelle and Fortier; indifferent.

10th Arcade. Specimens of woven and printed tapestry, by Roby and Petit; both very fine, as well with respect to designs as colours.

11th Arcade. White earthenware manufactured by Pattes, in the department of l'Oise; extremely fine and good.

12th Arcade. The model of a monument by Fouquet. Imitation of painting in feathers, the composition of Bouillard; neither remarkable.

13th Arcade. Fine specimens of cotton, carded and spun by the machines in Delaitre's manufactory in the department of Seine and Oise.

14th Arcade. Fine woven cotten, the produce of the manufactory of Fonfrede in the department of the Haute Garonne.

15th Arcade. Plain and printed cottons, the

the manufactory of Gremont and Bané; very fine.

16th Arcade. Different ſpecimens of woven cotton, worth viewing.

17th and 18th Arcade. Excellent cloths of different colours, manufactured in Fere and Chateauroux.

19th Arcade. Pocket-handkerchiefs, the firſt ſpecimen of the kind from a large manufactory, erected for that article in the department of Maine and Loire.

20th Arcade. All kind of ſmith-work, hatchets, ſpades, pickaxes, files, &c. Hard-ware, ſuch as knives, ſciſſors, ſnuffers, watch-chains; the poliſh fine.

21ſt Arcade. Specimens of woven cotton, the promiſe of improvement in that line.

22d, 23d, and 24th Arcades. Fine cloth called Draps de Louviers, manufactured in the department of d'Eure; not eaſy to determine which of the three ſhould bear away the prize.

25th

25th Arcade. Silk and cotton ſtockings, manufactured in Beſançon.

26th Arcade. Cottons from Pont Audeme. The colours and patterns not very fine.

27th Arcade. Very excellent linen cloths from the ſame place.

28th Arcade. The fineſt piſtols, rifle-barrelled guns, ſabres of the moſt coſtly workmanſhip, the pride of the national manufactory at Verſailles. Theſe fine ſpecimens of taſte, invention, and execution, derived additional luſtre from the manner in which they were grouped or arranged.

29th Arcade. Very fine patterns of tiffany and gauze.

30th and 31ſt Arcade. Fine ſpecimens of tanned leather, from two tanneries in Pont Audemer.

32d Arcade. Linen and pocket handkerchiefs from the ſame place.

33d Arcade. Cotton ſtockings, and muſlins from a manufactory in Troyes.

34th Arcade. Copperſmith work, excellent

cellent, but ſtill inferior to that of England.

35th, 36th, and 37th Arcades. Silk and cotton ſtockings, manufactured at Troyes.

38th Arcade. Sealing wax of different colours ſcented. The ſticks were very fine, and diffuſed an agreeable ſmell without being burned. I bought twelve ſticks for thirty ſous, each ſix inches in length, and a quarter of an inch in thickneſs, of different colours, red white, green, blue, and brown.

39th Arcade. Glaſſes of different kinds, blown at Gorra, near Paris.

40th Arcade. A complete ſet of the new weights and meaſures, executed by order of the Miniſter of the Interior.

41ſt Arcade. The new weights and meaſures, executed by Ciceri, and in the 42d arcade, the machines by which the new weights and meaſures are divided, by Kuts; this artizan excels Ciceri in the execution of thoſe articles.

43d Arcade. Books printed on vellum paper in the office of Didot, the younger; namely, Contrat Social, Juvenal, le Telemaque, Anacharsis, &c. They are all master-pieces in the typographic line.

44th, 45th, 46th, and 47th Arcades. Models of different machines. I could not find any marks of excellence in them, they were very clumsily executed. I was surprized to find that they should be offered as specimens of national ingenuity.

48th and 49th Arcade. Excellent specimens in general of cotten and woollen cloths, which did great credit to the manufactory in Beauvais.

50th Arcade. A large assortment of fabres, &c. manufactured in Provoteaus.

51st Arcade. Plates of horn for lanthorns; very large, pure, and transparent.

52d Arcade. Several costly articles of dress sewed in such a manner, that the seam was not to be discerned. I had not the good fortune to see them, as they were soon taken away.

53d

53d Arcade. Stoneware manufactured in Vauderanges in imitation of the Engliſh.

54th Arcade. Excellent tin work, ſuch as ink-ſtands, flower-pots, &c. The form was beautiful, painted in different colours: ſome of the deſigns were very happily conceived and executed, they were done by Deharme.

55th Arcade. A handmill, well conſtructed, by Durand, which ground and ſifted at the ſame time. He has invented ſeveral mills on different conſtructions: he is a mill-wright.

56th and 57th Arcades. Several ſpecimens of porcelain, the produce of the national manufactory at Seve, ſuch as tea urns, baſons, coffee-pots, plates, tureens, and large and ſmall vaſes of all colours, figures, and groupes, in biſcuit, ſo white and fine, that they might be eaſily taken for gips. A round table of three feet in diameter, compoſed of many ſmall pieces of blue ground, with white bas-relief, in imitation

imitation of Wedgewood ware; notwithſtanding it was not free from blemiſhes, yet on the whole it was very neat and fine. On the porcelain there were two beautiful landſcapes, fourteen inches in length, and ten in heighth. The form, deſigns, colours, and gilding of the porcelain at Seve are entitled to great praiſe.

In the mean time it may be proper to obſerve, that two kinds of porcelain are manufactured at Seve, ſoft and hard, the firſt is more ſhowy, but the laſt approaches nearer to true and real porcelain.

58th Arcade. Pierre Didot, the printer, and Fermin Didot, and Louis Herhan, letter founders, or letter cutters, exhibited ſome of the newly invented ſtereotypic plates, in which each page of the book was cut or engraved, ſuch as was uſed in the infancy of printing, but of a compoſition ſo hard, that it will ſerve to work off from eight to ten thouſand copies. The expence is repaid in the number of copies, though they are ſold at a low price. In this arcade

cade I ſaw an edition of Virgil in 12mo. which ſells for fifteen ſous, Phædrus for twelve ſous, and Fables de Fontaine for fifteen ſous. There was likewiſe a ſplendid edition of Virgil on vellum paper, with copper plates, printed in this manner. A ſtereotypic edition of Callet's tables of logarithms, &c. Some books have juſt iſſued from the ſame preſs, which do great honour to this new invention.

59th Arcade. All kinds of chryſtal glaſs from Lebon's fabric in Creuzot, in the department of Saone and Loire. Theſe glaſſes are very beautiful in matter, form, and poliſh.

60th Arcade. A complete ſervice of porcelain and decorations, deſigned for the table of a ſugar-baker in Paris.

61ſt Arcade. The model of a threſhing machine, by a miller in Rouen, not equal to our threſhing machines in Denmark.

62d, 63d, and 64th Arcades. Spinning machines from a fabric in Luat, in the department of Seine and Oiſe, together with

ſome

ſome ſweet-meats by a confectioner in Paris.

65th Arcade. Porcelain from Dehl's and Gerhard's manufactory, Rue de Temple, Paris. This porcelain is better, and more durable than that of Seve; it is called in general Porcelaine d'Augoulême. Amongſt many other fine pieces, I ſaw upwards of twenty paintings on porcelain, the largeſt of which was twelve inches long, and ten broad. The ſubjects flower and fruit pieces, a ſcene by moonlight, a young woman ſitting, two old heads, and different landſcapes. The deſigns were correct and natural, the colouring fine, the light and ſhade happily blended, and the execution of the whole inimitable. All theſe fine pieces did not experienc any caſt or blemiſh in the burning, which is not the caſe in other fabrics. It muſt be obſerved, however, that Dehl and Gerhard excel in the colour line, and that their furnaces are conſtructed in ſuch a manner, that the colours do not melt or run into each other.

The

The ſhades of the colours were much more delicate and clear than in thoſe of Seve.

In this arcade I alſo found a number of things worthy of being named. A vaſe of three feet in height, two ſmaller ones, a foot in height each, two little blue and grey vaſes of excellent workmanſhip.

Two groups of figures in biſcuit, two table-clock caſes, the biſcuit was beautiful, and of the pureſt white.

60th Arcade. Many landſcapes, deſigns in architecture, vaſes, and other figures engraved on copper plates by Defrance, which he calls *tableaux en creux*, *gravés autour*. This curious and excellent artiſt engraves the whole by a mechanical lathe, which imparts all the innumerable motions of the hand, and in many inſtances with greater ſucceſs and perfection. With this inſtrument he can engrave plates after any deſign. He has alſo a manufactory of ſnuff-boxes of tortoiſe-ſhell, and other compoſition, for which he has found a very great demand. I expreſſed a wiſh to ſee his lathe,

lathe, which I ſuppoſe to be a maſter-piece in mechaniſm; he aſſured me that no one ever ſaw it, except his wife or children.

67th Arcade. Perrin's metallic linen and gauze, or linen interwoven with ſteel threads. The texture beautiful, and of different degrees of fineneſs.

I was very much pleaſed with this new effort of the ſhuttle, and am perſuaded this metallic tiſſue will be found extremely uſeful in many branches of manufacture, ſuch as ſifting in the porcelain, glaſs, and fine earthernware. It may alſo be employed in the making of vellum paper, and paper of different kinds, ſo as to render the tranſverſe lines ſcarce viſible. It is only neceſſary to ſend the ingenious inventor the meaſure, which he executes to any length, breadth, or fineneſs, at a reaſonable price. The only articles in this collection that merited, in my opinion, peculiar diſtinction were the following:

Bruguet's watch-work, particularly his echapement in the ſecond arcade; Deſarnod's

nad's economical ſtoves and boilers, in the ſixth arcade; Berthier's ſteel-work in the twentieth arcade; fire-arms from Verſailles, in the twenty-eighth arcade; Gremont's and Barre's printed cottons, in the fifteenth arcade; Patte's white earthern or ſtone-ware, in the eleventh arcade; ſpecimens of the ſtereotype and ſtereotypic printing, by Pierre Didot, Fermin, Didot, and Louis Herhan, in the fifty-eighth arcade. Defrance's mechanical engravings in the ſixty-ſixth arcade, and finally, Dehl's and Gerhard's porcelain, in the ſixty-ſixth arcade.

The whole exhibition, however, is very well worth viewing; beſides, the idea is new. You there ſee many proofs of the induſtry and ingenuity of the nation. Whoever views them with an impartial eye muſt, however, acknowledge that they fall far ſhort of that perfection of which they are capable; but when coupled with circumſtances, ſuch as when ſo many artiſts, manufacturers, &c. are enrolled as con-

ſcripts, or ſent to the armies, the general ſcarcity of money, the want of encouragement, in conſequence of the total extinction of trade and local convulſion, it is matter of ſurpriſe that any thing worthy of public attention could be offered. Let France once enjoy the bleſſings of peace: let the huſbandman ſteer the plough in quiet, and reap the fruits of his own induſtry, then manufacturers, handicrafts, commerce, and the fine arts, will daily gather ſtrength, ſhoot forth, and expand into luxuriancy. Peace, I know, is the general wiſh of the people, a wiſh that is founded on good ſenſe, and patriotiſm and induſtry will then contribute more to their real happineſs, than the ſplendid but illuſive acquiſition of ſtates and provinces, and the folly of diſſeminating the ſeeds of republicaniſm in other countries.

On the fifth complementary day, about eight o'clock in the evening, there was a general diſcharge of artillery, and at nine another from the cannon planted before the

the palace of the Directory, and along the banks of the Seine. This diſcharge was immediately followed by ſix hundred rockets from the Pont-neuf, which aſcended to a conſiderable height, and formed a beautiful appearance in the air. The public offices and telegraphs were hung with lamps, lighted up with different colours, which had a very pleaſing effect, as they were arranged to the beſt advantage. Glaſs lamps are not uſed in thoſe illuminations, but flat lamps of potter's earth from three to four inches. They are not filled with oil, but a ſubſtance prepared from the offals of oxen, calves, and lambs, which are purchaſed in the ſlaughter-houſes for that purpoſe. In ſerene weather they burn very clear, but wind or rain immediately extinguiſhes them.

The 22d of September, 1798, was a peculiar feſtival. There were rowing matches on the Seine, and wreſtling in the Champ de Mars, for ſmall prizes, ſuch as ribbons,

&c. The victors were immediately inveſted with the prize, and ſometimes carried off on the ſhoulders of the populace in triumph, particularly if the conteſt was long doubtful. In this liſt I ſaw fourteen or fifteen young men, well formed by nature for ſuch athletic exerciſes.

This amuſement was ſucceeded by the entrance of two chariots. Some of the victors of the 14th of July ſtood upright in one, and ſome of theſe of the 14th of Auguſt in the other. A party with lighted brands ſet fire to two figures of wood, the one repreſenting Deſpotiſm, and the other Fanaticiſm, and then danced round the blaze.

In the afternoon the Directory, Miniſters, &c. aſſembled in the Military School, from whence they moved in proceſſion in the ſame order which I have already mentioned on the feaſt in commemoration of the foundation of the Republic. A group dreſſed in the coſtume of the ancient Gauls walked

walked before the Directory, with a banner containing the names of all the departments. The following lines were written on the back of this fane:

La République les a tous réunis,
Ce n'eſt plus qu'un même peuple.

A trophy was borne on one ſide of the departmental enſign, formed of the ſhields of the Batavian, Ciſalpine, Helvetic, and Roman Republics, with the following inſcription:

Que leur alliance avec le peuple François
ſoit eternelle.

As ſoon as the proceſſion had reached the altar, raiſed to the genius of the country, the departmental enſign, and the trophy of the allied republics, were placed at the foot of it, with great ceremony, accompanied by a triumphal ſong. Treilhard, the preſident of the Directory, delivered a ſpeech, in which he congratulated the French nation on the ſucceſs of their arms, and the proſpect of returning peace. An ode was then ſung, compoſed for the occaſion,

caſion, the words by Chenier, and the muſic by Martin :

A notre cœur ſenſible et brave
Rien ne peut inſpirer l'effroi :
Ce qu'il haït le plus, c'eſt un Roi ;
Aprés un Roi, c'eſt un eſclave

Si nos aïeux furent long temps
Sujets des rois, jouets des prêtres ;
Nous vivrons, nous et nos enfans,
Et ſans préjugés et ſans maîtres.

The preſident then read over the names of the citizens who had contributed to the ſtability or happineſs of the Republic in the courſe of the preceding year, either by their perſonal bravery, patriotic eſſays, inventions, induſtry, &c. All thoſe were diſtinctly repeated by a herald, who diſtributed printed liſts of the names to the circle around him.

Horſe and chariot racing followed next. Two horſes were remarkably fleet, one came from Normandy, and the other from Limoges. Thoſe two won the honours of the courſe.

The chariot races afforded the higheſt amuſement ; they were built in the manner

ner of the Roman triumphal cars, with two wheels, and open behind. The charioteer ſtood upright. Four ſtarted; but the contention only lay betwixt two. One of the charioteers met with an accident. Lagrange, formerly an officer in the Huſſars, who had fought with great gallantry againſt the Pruſſians in Champagne, in attempting to reach the goal, he ſtruck his wheel againſt his rival's, by which he was pitched to a conſiderable diſtance, and received ſo dangerous a wound in his head, that he was carried for dead out of the race ground. There were ten prizes diſtributed, the largeſt amounted to twelve hundred, and the leaſt to eight hundred franks. Eight of thoſe conſiſted of carabines, piſtols, and ſwords from the manufactory of Verſailles, one of porcelain manufactured in Seve, and the laſt a ring and watch.

The aeroſtatic corps of Meudon, claimed a ſhare in the amuſement of the day. An air balloon of thirty-one feet in diameter was launched, and aſcended to the height

of

of about one hundred and fifty feet in the air, an aeroſtatic officer ſat in the boat or car, and directed its courſe. A kind of fort or redoubt, compoſed of wood, was raiſed in the middle of the field, the aerial navigator ſailed for ſome time round it, and when he came directly over it, threw a globe filled with combuſtible matter into the fort, which inſtantly enveloped the whole in flames. A glaſs globe filled with phoſphorus would be ſufficient for this purpoſe.

The Directory now returned to the place from whence they ſet out.

The day was fine, and the novelty of the ſucceſſive ſports drew an immenſe crowd of ſpectators, not leſs, I am ſure, than two hundred thouſand, if not more. Government ſeems to know the Pariſians well, and how eaſily they may be managed with ſpectacles of this kind, like the Romans, who only wiſhed for bread and ſhows, (*panem et circenſes*). Through the friendſhip of the Daniſh miniſter, Mr. Dreyers, I

received

received a ticket, by which I was admitted to the inner room in the Military School; I had the good luck to get a place in one of the balconies where I found myself in company with the following ladies, Mesdames Reubel, Treilhard, Bonaparte and her daughter, Simon, and Recamier. The two last are bankers' wives, and justly famed for their beauty. Madame Bonaparte is very handsome, more so in my opinion than Madame Tallien. The accident which befel Lagrange affected Madame Tallien so much, that she almost fainted as they carried him by the balcony. At night the illuminations were very general, and the lamps were disposed in such symmetry, that the effect was charming beyond what I have either time or language to describe.

FINIS.

A NEW EDITION,

Corrected and revised, in two Volumes duodecimo,

Price 10*s. in boards*,

BIOGRAPHICAL MEMOIRS

OF TWO HUNDRED OF THE

Founders of the French Republic,

AND OF

Other Persons the most distinguished in the

PROGRESS OF THE REVOLUTION.

Critical Opinions of this Work.

"We have only to observe on the present Volume, that it is generally written with an elegance and vivacity of style which are peculiarly pleasing; that the Anecdotes are mingled with many judicious and sensible reflections; that the politics are free, but temperate; that the estimate of characters is apparently impartial; and that it abounds with the most interesting and entertaining matter. About a hundred and thirty characters are sketched in this popular Volume, and a very useful chart is prefixed of the proscriptions of parties in France from that of the Brissotines in June, 1793, to that of the Royalists in September, 1797."

Analytical Review.

"We can promise to our readers, whatever their political principles may be, considerable amusement and information from this volume, which contains Anecdotes of above one hundred and thirty of the most eminent persons who have "strutted and fretted their day" upon the grand theatre of French politics. The author appears to have taken great pains to collect materials from the best sources."

Critical Review.

Printed by T. Gillett, Salisbury-square.

LIBRARY OF CONGRESS
0 030 227 864 7